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MINUTES OF THE PROCEEDINGS

OF THE

METEOROLOGICAL COUNCIL

1903–1904.

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1905.

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1903–1904.

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MINUTES OF THE PROCEEDINGS

OF THE

METEOROLOGICAL COUNCIL.

1903–1904.

63, *Victoria Street, S.W., 22nd April*, 1903.

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN. | PROFESSOR DARWIN.

MR. SHAW (*Secretary*).

622. Minutes 606–621 of the last meeting (25th March) were read and confirmed.

623. *Antarctic Expedition* (1) *Observations at Greenwich noon.* — Read—the following letter:—

M.O. 908.

Foreign Office,
April 7th, 1903.

SIR,

WITH reference to the letter from this Office of the 12th July, 1901, relative to magnetic and meteorological observations which were required to be taken in connection with the work of South Polar Expeditions, the Lords Commissioners of the Admiralty state that as the Antarctic Ship "Discovery" will remain South another season they have taken steps to secure that these observations shall be continued till March 31st, 1904.

I am accordingly directed by the Marquess of Lansdowne to request that the Meteorological Office will be good enough to co-operate in these observations for another year.

I am, &c.,
T. H. SANDERSON.

The Secretary
To the Meteorological Office.

It was resolved to extend the period for the collection of observations at Greenwich noon aboard British ships (Minutes 9, 143) in accordance with the request of the Marquess of Lansdowne.

—— (2) *Tabulation of Observations* (Minute 567).—Read—the following letter:—

M.O. 962.

Foreign Office,
April 15th, 1903.

SIR,

WITH reference to your letter of March 11th I am directed by the Secretary of State for Foreign Affairs to transmit to you, to be laid before the Meteorological Council a copy of a letter from the Admiralty relating to terrestrial magnetism and meteorology in connection with Antarctic Expeditions.

I am, &c.,
F. H. VILLIERS.

The Secretary
To the Meteorological Office.

25 Wt 76 5/03 D & S 23 14480

M. 1915.

Admiralty,
April 8th, 1903.

SIR,

WITH reference to your letter of the 9th February last relative to a suggestion of the German Ambassador that a tabulated statement should be drawn up embodying the results of the observations in terrestrial magnetism and meteorology made at the institutions of the United Kingdom and British Possessions abroad in connection with the work of Antarctic Expeditions during the years 1902–3; I am commanded by my Lords Commissioners of the Admiralty to request you will inform the Marquess of Lansdowne that, should they undertake the tabulation of the observations made by their directions, they will forward copies as requested.

My Lords however desire me to point out that it has not yet been settled by whom and in what manner the observations made by the various British authorities are to be discussed.

I am, &c.,
EVAN MACGREGOR.

The Under Secretary of State,
Foreign Office.

624. *International Committee* (1) (Minute 608).—The Secretary reported that he had visited Southport and had ascertained that the local committee were willing to find accommodation for the proposed exhibition; also that the gentlemen who were asked to act on the Committee had expressed their willingness to do so; that the Royal Meteorological Society had nominated Captain Wilson Barker, the President, and Mr. Baldwin Latham as representatives, and the Scottish Meteorological Society, Dr. Buchan and Mr. Omond; that a preliminary meeting had been held at the Office on April 21st and some suggestions had been drawn up; that it was proposed that the Committee should meet on Tuesday, May 19th, and Tuesday, June 16th.

It was resolved that the Hydrographer be requested to act with Mr. Shaw as the representatives of the Council on the Committee.

—— (2) Authority was given for the printing of the report of the meeting of the International Committee and for setting up in type at the discretion of the Secretary papers or reports, to be discussed by the Committee, and included in the Committee's report.

625. *Royal Meteorological Society—Kite Experiments.*—The Secretary reported the receipt of a letter from the Chairman of the Government Grant Committee, Board B., asking whether anything could be done in the direction of obtaining the use of a launch or tug from the Admiralty for the experiments "which would save the large item of £300" included in an application of the Royal Meteorological Society to the Grant Committee, and asking for a reply before April 29th. He further reported that he had communicated with the Hydrographer upon the matter and with the President of the Society and had learned at a meeting of the Committee of the Society that the President would place himself in communication with the Admiralty upon the matter.

He was authorised to reply to Professor Callendar that the Council regarded the provision of a suitable vessel as of very great importance to the success of the proposed experiments and if applied to they would be prepared to support an application for the loan of a vessel, and also to point out that if a grant were made by the Committee for the hire of a tug and it were found that the Admiralty were willing to lend one, the money thus saved would revert to the Government Grant Fund.

626. *Storm Signals—Dungarvan* (Minute 614).—Reported—reply from the Post Office to the effect that the usual charge would be made for telegrams sent from Dungarvan Post Office to Helvick Head.

It was resolved to add Helvick Head to the list of Storm Signal Stations, if the locality would provide the cone.

627. *Observatories—Valencia.*—The Secretary reported that at Mr. Cullum's request he had authorised the dismissal of J. Walsh, Messenger at the Observatory, on the ground that he did not properly perform his duties, and had received a letter from Walsh upon the matter.

The question was referred to the Chairman.

628. *Daily Weather Reports.*—Reported—the receipt of applications from Scarborough (M.O. 961) and Folkestone (M.O. 952) as to the conditions upon which daily reports of sunshine at those stations would be inserted in the reports of the Council to be supplied to the newspapers.

The Secretary was directed to prepare a memorandum stating the conditions applicable to such cases, viz., (1) that the observations be taken by means of trustworthy instruments, satisfactorily exposed; (2) that a daily report be sent by post or telegraph for p. 4 of the Daily Weather Report; (3) that the evening report for the morning papers reach the Office by 7 p.m.; (4) that all charges for telegraphing must be borne by the localities. He was authorised to accept reports from any station complying with the conditions, with the understanding that the arrangement may be terminated at any time at the discretion of the Council.

629. *Instruments.*—Submitted—the following letter:—

M.O. 972.

Admiralty, S.W.,
17th April, 1903.

SIR,

I FORWARD herewith, for your information, a table showing the stocks of meteorological instruments which are to be maintained at the different depôts for the use of His Majesty's ships.

No alterations have been made, except the omission of Coquimbo, the depôt there having been abolished.

I am, &c.,
T. H. TIZARD,
for Hydrographer.

The Secretary,
Meteorological Office.

STOCKS of METEOROLOGICAL INSTRUMENTS for the USE of HIS MAJESTY'S SHIPS to be KEPT at the DIFFERENT DEPÔTS.

—	Barometers.		Thermometers.				Hydrometers.
	Mercurial.	Aneroid.	Ordinary.	Maximum.	Minimum.	Screens.	
Meteorological Office... ...	45	120	250	80	80	50	—
Portsmouth	25	55	150	50	50	25	6
Chatham	25	55	150	50	50	25	6
Sheerness	6	15	30	10	10	10	6
Devonport	25	55	150	50	50	22	6
Queenstown (Haulbowline)...	5	10	15	8	8	—	3
Gibraltar	2	2	4	3	3	—	3
Malta	11	15	60	10	10	1	6
Halifax	3	4	20	4	4	1	3
Bermuda	3	4	20	4	4	1	3
Jamaica	3	2	10	2	2	1	3
Cape of Good Hope	7	8	33	8	8	2	6
Trincomali	3	3	10	4	4	1	6
Hong Kong	17	21	87	21	21	5	10
Sydney	5	6	25	6	6	1	10
Esquimalt	4	5	15	2	2	1	3
Bombay	4	3	10	4	4	1	6

630. *Instruments—Stock of Barometers for Mercantile Marine.*—Submitted—a memorandum from the Marine Superintendent asking for a new supply of at least six barometers on account of the increase in the number of observers.

Consideration deferred for further particulars.

631. —— *New Guinea* (Minute 554).—Submitted—the following letter from the Chief Government Surveyor Port Moresby and memorandum upon it by the Marine Superintendent :—

M.O. 750.

Department of Lands and Survey,
Port Moresby, British New Guinea,
27th January, 1903.

SIR,

I HAVE the honour to forward herewith receipts for cases of meteorological instruments, Nos. 2 and 6.

No. 2 is at Samarai. The barometer was broken when the instruments were received here so I substituted another one, which I first carefully examined and found practically correct, it is "Adie, C. 715," and in first-class condition.

The maximum thermometer, No. 2,043, is out of order, and when the mercury is correctly set it will not stay in position if the tube be brought anywhere near level, therefore I am sending them another, Max., Hicks No. 153,787, in proper order.

I do not expect readings of value from Samarai for some little time, because they have taken it upon themselves to put the instruments in a shed with an iron roof, and I am sending instructions to have a thatched shed put up before the readings will be accepted.

I am, &c.,
J. RICHMOND,
Chief Government Surveyor.

The Secretary,
To the Meteorological Office.

Six sets of instruments have recently been lent by the Council to the Government of Queensland (Minute of 26th February, 1901, p. 135). Barometer Adie C. 715 mentioned, is one of those bought by the Queensland Government in 1890. During that year they bought instruments through this Office as follows :—

Barometers.

7th January	...	...	12	...	Nos. 697 to 708
6th February	...	...	12	...	„ 709 „ 720
19th April ...	...	...	11	...	„ 721* „ 731*
11th November	...	...	11	...	„ 735 „ 745

Maximum and Minimum Thermometers in November.

22 Maximum solar.
20 Minimum terrestrial.
2 Thermographs, Nos. 67–68.

In 1890 three sets of instruments were lent also.

632. *Publications—Pilot Charts.*—Read—M.O. 920 from the deputy controller of the Stationery Office stating that the application for 200 additional copies of the Pilot Charts for official use (Minute 538) would be dealt with by the Controller and in the meantime 750 copies of the April chart had been ordered out of which the requirements of the office might be met.

633. —— *Presentation Copies.*—The Secretary was authorised to exchange publications with the Observatory at Ogyalla, Hungary, and to send to Geheimrath von Neumayer, recently retired from the German Seewarte, copies of publications at his request (M.O. 985).

634. *Sea Temperature Observations*—The form for the return of observations of sea temperature was approved after revision.

635. *Office Staff* (1) (Minute 315).—Mr. Lempfert was re-appointed for one year at a salary of £300 in accordance with the memorandum in Minute 277.

---

* These were lost in the s.s. "Dacca."

Office Staff (2).—It was resolved that Mr. Gaster's annuity (Minute 598) be paid in monthly instalments, for one half year and thereafter quarterly, the first instalment to be paid in May 1st, a suitable deduction for income tax being made in accordance with the practice of the National Debt Commissioners.

—— (3) *Increments of Salary.*—The following increments to the Office Staff were allowed (Minutes 1902–3, pp. 4 and 5) :—

—	Salary in 1902–3.	Proposed for 1903–4.
	YEARLY.	
CLASS I.—MAXIMUM £300 :—	£ s. d.	£ s. d.
R. H. Curtis	285 0 0	290 0 0
MAXIMUM £275 :—		
F. J. Brodie	230 0 0	235 0 0
CLASS II.—MAXIMUM £200 :—		
R. Sargeant	180 0 0	185 0 0
CLASS III.—MAXIMUM £150 :—		
R. F. Wallace (Minutes 1902–3, p. 12)	135 0 0	140 0 0
A. R. Simpkins	130 0 0	135 0 0
F. W. Snell...	125 0 0	130 0 0
CLASS IV.—MAXIMUM £110 :—		
E. J. Hood	105 0 0	110 0 0
J. T. Williams	90 0 0	95 0 0
	WEEKLY.	
BOY CLERKS.—MAXIMUM £1 :—		
W. Hayes	0 15 6	0 17 0
H. E. Carter	0 14 0	0 15 6
W. Tomkins (Minutes 1902–3, p. 84)	0 11 0	0 12 6
L. Tarrant (Minutes 1902–3, p. 12)	0 11 0	0 12 6

The salary of A. G. Goad (Messenger) was raised from 18*s.* 6*d.* to £1 a week.

—— (4).—Reported—that Mr. F. W. Snell had repaid the sum of £5 part of the cost of his instruction in shorthand and typewriting (Minutes 1901–2, pp. 3 and 7).

636. *Logs.*—Fifteen received, one excellent (Capt. F. C. A. Lyon, R.N.R.)

637. *Reports of Work for March*, 1903 :—

MARINE BRANCH.

April 21st, 1903.

Examined 22 new meteorological logs and two short meteorological logs.

Discussion south of Equator, between the West Coast of Africa and 90° W. longitude. August orginal chart sent for engraving and preparing September.

Indian Ocean District, from latitude 30° N. to 30° S. Preparing and extracting data in office logs, also totalling instrumental observations and tabulating winds. Logs of H.M. ships received from Admiralty for extraction and discussion.

Monthly Pilot Chart of the North Atlantic and Mediterranean, April, 1903, proofs examined and passed for press. May Chart sent to the lithographer. Preparing the June Chart. Charting sea temperatures for February and March, 1903; also charting pressure observations and obtaining tracks of storms for February and March, 1903. Registering and acknowleding reports and observations, and issuing Charts and fresh supply of Forms. 128 reports containing observations to be used for the Charts received during the month.

Atlantic Synoptic Weather Charts, February 17th to 22nd, copied in relation to dust-storm inquiry.

Copies of ice reports received from various vessels sent to "Shipping Gazette" for publication.

CAMPBELL HEPWORTH.

OBSERVATORY BRANCH.

April 1st, 1903.

Daily Means.—The mean values for 1900 are still in hand.

Beaufort's Scale Equivalents.—A table of wind scales prepared for Council; further mean values calculated, and others rearranged, and diagrams drawn.

Kite Experiments.—The diagrams drawn last month have been revised for errors in original curves; in several instances the diagrams were re-drawn, and a large diagram has been prepared showing isothermal lines for the period.

Dines' Barograph.—The scale-value of this instrument has been determined from data obtained from the curves; the working of the instrument has been examined, and a memorandum on the subject prepared for the Council.

Miscellaneous:—

(1) Photographic sunshine records from Edgbaston have been tabulated for comparison with the C. S. records from the same place.

(2) Bournemouth sunshine tabulations and cards for February have been examined and a brief report submitted.

(3) The anemometer records for gale of February 26th–27th have been examined, and reports based on them have been supplied to Kingstown (Dr. B. Power), and to Dublin (Ordnance Survey Office, and to Sir John Moore, M.D.).

(4) Damaged portion of Fleetwood anemometer sent for repair, and returned to Fleetwood with instructions.

(5) Three months' aneroidograms from Kilkenny Castle copied, and originals returned to Kilkenny.

(6) Ben Nevis observations copied and sent to Prof. Hergesell.

(7) Holyhead anemograms for February tabulated and copies sent to Dublin.

(8) Supply of anemogram forms received from the S. Office examined before being passed into store.

(9) Supply of aneroidogram forms similarly examined.

(10) Wind data for N. Shields for December 24th–26th, 1902, January 15th–17th, and February 26th–28th, 1903, supplied to Messrs. Bramwell and Bell, Newcastle-on-Tyne.

The examination of data from the Observatories has been kept strictly up to date.

R. H. CURTIS.

FORECASTING BRANCH.

March, 1903.

Daily Weather Report.—Monthly correction and addition sheet for February prepared and sent to printer. Copy for Maps IV. and V. on page 2 completed as far as to June, 1903.

Weekly Weather Report.—Usual daily and weekly remarks written and charts prepared.

Monthly Summary for February.—Maps partially prepared. Remarks written, revised and sent for press.

Forecast Checking (8.30 p.m.).—Done to date by Mr. Lempfert, and summarised in this branch.

Storm Warning Checking (*Primary*).—Done to date.

" " (*Final*) *for Annual Report.*—Completed for January to April, 1902.

Gale of 26th–27th February, 1903.—Aneroidograms tabulated for a large number of stations, and three hourly charts, showing progress of storm, partially prepared.

Tabulation of Anemograms.—Alnwick Castle—For April to December, 1902, and *Kingstown*—For November and December, 1902.

Examination and Re-measurement of Barograms and Thermograms.—Valencia and Kew for January and February, 1903.

FREDK. J. BRODIE.

638. *Storm Warnings:—*

Warnings Issued.—Signals hoisted on 11 days; total number of districts warned, 55.

In 20 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 14 districts by strong winds (force 7 or 6). In 21 districts they were not required.

Gales experienced, for which no Warnings were Issued.—None.

639. *Forecasts.*—Submitted—The following report on the Forecasts, issued at 8.30 p.m. daily, during the month of March, 1903 :—

The letters used have the following signification :

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	58	55	57	91
,,	b	29	39	34	
,,	c	13	6	9	
,,	d	0	0	0	
Scotland, E.	a	49	65	57	88
,,	b	35	26	31	
,,	c	16	9	12	
,,	d	0	0	0	
England, N.E.	a	52	45	49	88
,,	b	39	39	39	
,,	c	6	16	11	
,,	d	3	0	1	
England, E.	a	61	32	47	82
,,	b	32	39	35	
,,	c	7	29	18	
,,	d	0	0	0	
Midland Counties	a	65	45	55	88
,,	b	29	36	33	
,,	c	6	19	12	
,,	d	0	0	0	
England, S.	a	71	39	55	86
,,	b	23	39	31	
,,	c	6	22	14	
,,	d	0	0	0	
Scotland, W.	a	55	61	58	90
,,	b	32	32	32	
,,	c	13	7	10	
,,	d	0	0	0	
England, N.W.	a	45	52	49	83
,,	b	29	39	34	
,,	c	20	9	14	
,,	d	6	0	3	
England, S.W.	a	58	55	57	86
,,	b	29	29	29	
,,	c	13	16	14	
,,	d	0	0	0	
Ireland, N.	a	52	61	57	82
,,	b	35	36	35	
,,	c	10	3	7	
,,	d	3	0	1	
Ireland, S.	a	55	58	57	91
,,	b	29	39	34	
,,	c	13	3	8	
,,	d	3	0	1	
Summary.					
British Islands	a	57	51	54	87
,,	b	31	36	34	
,,	c	11	13	12	
,,	d	1	0	0	

640. *Accounts* (1)—*Audit.*—Reported—that the cash accounts for the quarter ended the 31st December last had been this day examined by Prof. Darwin and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st October last, when there was a balance of £1,668 14*s.*, were £3,924 17*s.* 8*d.* against £3,762 15*s.* 1*d.* in the corresponding period of the preceding financial year. The payments were £3,982 17*s.* 7*d.* against £4,153 11*s.* 4*d.* during the same period in the previous year. The balance in hand and at the bank on the 31st December, amounted to £1,610 14*s.* 1*d.*, and at the same date in 1901 to £2,009 18*s.* 9*d.*

—— (2).—Submitted—The following statement:—

	£	*s.*	*d.*
Cash balance on 24th March	4,313	12	1
Receipts from 25th March to 21st April	3,638	14	8
	7,529	6	9
Cheques drawn from 25th March to 21st April ...	2,705	0	2
Cash balance on 21st April	£5,247	6	7

641. *Library.*—Submitted—List of publications received since the last meeting:—

Bell, Arthur H.—The romance of a raindrop.

Berne, Eidgenössisches Oberbauinspectorat, Hydrometrisches Abteilung.—Graphische Darstellung der schweizerischen hydrometrischen Beobachtungen und der Lufttemperaturen und Niederschlagshöhen für das Jahr 1901.

Bombay, Government Observatory.—Report on the condition and proceedings of the Government Observatory, Colába, for the year which ended with the 31st December, 1902.

Cordoba, Oficina Meteorológica Argentina.—Anales. Tomo 14.

Hastings.—Annual report of meteorological observations for the year 1902. H. Colborne, Borough Meteorologist.

Hong-Kong Observatory.—China Coast meteorological register. 1902.

Lockyer, Sir Norman, and Lockyer, W. J. S.—The relation between solar prominences and terrestrial magnetism.

London, Admiralty, Hydrographic Office.—The West India Pilot. Vol. I. From Cape Orange in Brazil to Cape Sable in Florida, with the adjacent islands. 6th ed.

Naples, R. Osservatorio di Capodimonte.—Osservazioni meteoriche. 1902.

—— *R. Specola di Capodimonte.*—Riassunto delle osservazioni meteorologiche fatte nella R. Specola di Capodimonte. Nota del Vittorio Alberti. 1901, 1902. 2 vols.

Strassburg, International Kommission für wissenschaftliche Luftschiffahrt.—Protokoll über die vom 20. bis 25. Mai 1902 zu Berlin abgehaltene dritte Versammlung der Internationalen Kommission für wissenschaftliche Luftschiffahrt.

Toronto, Magnetical Observatory.—General meteorological register for the year 1902.

63, *Victoria Street, S.W., 8th May*, 1903.

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.

PROFESSOR DARWIN. | THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

642. The Minutes (622-641) of the last meeting, 22nd April, were read and confirmed. It was ordered that reports of work and lists of publications received be filed and laid on the table in future and not printed.

643. *Annual Report.*—It was agreed that the Annual Report be prepared on the same lines as last year.

644. *Annuity for Mr. Gaster* (Minute 598).—The Secretary reported correspondence P.C. 1,234, M.O. 1,116, 1,117, with the National Debt Commissioners and the Bank of England respecting the transfer of stock. It was resolved that the Corporate seal be affixed in the prescribed manner to a power of attorney to the Bank of England for the transfer to the National Debt Commissioners of such amount of 2½ per cent. annuities now standing in the name of the Council as may be fixed by the National Debt Commissioners as the equivalent of an annuity of £150 on the life of Mr. F. Gaster, at the time of making the declaration in the form prescribed by the Commissioners.

645. *Office Staff* (Minute 610) (2).—The Secretary reported that no reply had been received from the Post Office to the application as to the supply of a telegraph clerk, and that it was desirable to make arrangements immediately for the work of the forecast branch.

Resolved—That Mr. Harries be transferred to the forecast branch and be promoted to the vacant first-class clerkship; also that the Secretary report upon the consequent changes in the arrangements of the Office.

—— Reported—That Miss E. C. Humphreys had been appointed one of the additional female clerks under Minute 610 (3), on probation for one year, at a salary of £50 per annum, payable monthly, the arrangement to be terminable by a month's notice.

646. *International Telegraphic Service.*—A letter from the Seewarte suggesting the organisation of an international 6 a.m. service of observations was ordered to be translated and printed in the Minutes.

M.O. 1,183.

Deutche Seewarte, Hamburg,
4th May, 1903.

THE fact that observations have been obtained at 7 a.m. Greenwich time from a number of stations in the British Isles, and the improvement in the telegraphic transmission of meteorological messages have made it possible during the last two years to issue the daily weather report of the Seewarte at about 9.10 or 9.20 a.m. instead of at 12.15 p.m., and so to gain about three hours of time. This has made it possible, in a large number of cases, to fulfil the wishes expressed by many German agriculturalists to supply them with reports which might be of use to them in making arrangements for the following day, during the dinner hour. This great improvement, for which we are indebted to the exertions of the telegraph office and to the kindness of foreign meteorological organisations, has raised the question among German agriculturalists of the possibility of realising the above aim completely by making the hour of observation earlier still. At present, a considerable number of districts receive the reports too late to make effective use of them in spite of all our efforts.

The difficulties in the way of such a reform in the hour of observation in Western Europe are considerable, but the advantages which would accrue, not only to German agriculture but also to that of other European countries, are also great.

For this reason the German Admiralty has desired the Seewarte to ask the Meteorological Council whether it would be practicable in the British Isles to alter the hour of observation to, say, 6 a.m. Greenwich time, or to some similar hour, and to have the messages transmitted immediately. To reap the full benefit of such a reform, it ought to be carried out uniformly throughout Western Europe. For this reason, it is proposed to raise the question at the meeting of the international meteorological committee in September. The importance of the matter has, however, made it seem advisable to make preliminary inquiries at this early date. The Seewarte would be glad to hear your views and those of your government on this question before the end of July, in order that those interested in the matter may be duly informed of them.

Should it prove impossible to make satisfactory arrangements with the present system of stations, but be possible to do so with others, the Deutsche Seewarte would be glad to receive the names of such stations, and to be informed of the conditions under which the telegrams could be obtained. This solution of the difficulty would, however, be much less satisfactory than a general international regulation of the hours for telegraphic observations.

After the above explanations it will hardly be necessary to state that interruption of the further development of the telegraphic interchange of meteorological messages on the present basis of agreement is to be avoided, and that we are at present only concerned with a preliminary inquiry as to whether the above-mentioned changes could be introduced into the present system.

(Signed) HERZ.

The Meteorological Office,
London, S.W.

647. *Telephone.*—Reported—That Mr. E. B. Mullins had called on behalf of the Post Office to suggest that the Council should become subscribers to the P.O. telephone service in accordance with the Form of Agreement No. 29. Minute 13, 1900-1.

It was resolved to subscribe for one year for the ordinary message rate service (£5 per annum with message fees), but not to insert the name of the Office in the telephone directory.

648. *East Riding County Council.*—The Secretary reported that in reply to a request from the East Riding County Council to supply rainfall information from Spurn Head (M.O. 1,095 and 1,127), he had suggested that the most satisfactory arrangement would be for the County Council to establish an official climatological station, and to report observations to the Office, receiving the weekly weather report and supplements in exchange.

Approved.

649. *Bettws-y-Coed Urban District Council.*—Read—M.O. 1,113 from the Council asking for information as to the purchase of instruments for a station, and the publication of records.

The Secretary was authorised to include the returns in the Monthly Weather Report upon the establishment of the station.

650. *Royal Meteorological Society: Kite Experiments* (Minute 625).—Reported—The receipt of a letter from the Secretary of the Royal Society asking for particulars of the requirements in respect of a steam vessel for the proposed experiments in the ensuing summer.

The Secretary was authorised to consult Mr. Dines, and supply the information desired for the use of the Council of the Royal Society.

651. *Instruments: Mercantile Marine* (Minute 630).—Submitted—The following memorandum by the Marine Superintendent:—

8th May, 1903.

The statement attached shows that captains of 129 vessels in the Mercantile Marine using M.O. instruments should now be contributing observations to this Office, as against 113 in April, 1899. Some captains who were supplied with instruments have failed to fulfil their obligations. In April, 1899, there were 25 defaulters, at the present time the number stands at 26. Every endeavour is being made to trace the defaulters, and recover the instruments.

The actual number of captains keeping the usual Register during the year ending 31st March, 1903, was 103. In addition to these, 13 kept Abbreviated Registers, using their own or their ships' instruments, and 291 Form No. 51.

A new agency was established at Sunderland in March last to which a supply of four barometers was sent. Of the 112 station barometers shown in the statement, a number (unknown) are marine barometers, and were supplied to stations prior to April, 1900.

C.H

DISPOSITION OF MERCANTILE MARINE AND STATION BAROMETERS IN APRIL, 1899, AND IN APRIL, 1903.

Disposition.	April, 1899.		April, 1903.	
Afloat, merchant ships	—	113	—	129
Stations, fishery	220	—	228	—
„ ordinary	90	—	112	—
		310		340
Stocks, Meteorological Office	—	37	—	*22
„ Liverpool Agency	—	8	—	5
„ Glasgow „	—	6	—	4
„ Dundee „	—	5	—	5
„ Hull „	—	4	—	3
„ Cardiff „	—	9	—	5
„ Southampton „	—	5	—	5
„ Sunderland „	—	—	—	3
Purchased since April 1899—				
For Stations...	17	—	—	—
For Mercantile Marine	7	24	—	—
Totals	—	521	—	521

* Stock at M.O. consists of—
5 Marine barometers.
12 Station barometers.
5 Marine barometers, repairing.
—
22

652. *Instruments: Lloyd's Station at Gibraltar.*—Read—M.O. 1,096 from Colonel Hozier, stating that the observations could not be obtained unless arrangements could be made for the payment of the observers as "the signalling at the station is conducted by the Royal Engineer Staff, and from what I hear, some payment will be expected."

The Secretary was directed to reply that under the circumstances the arrangement for obtaining the observations must be allowed to lapse.

653. *Publications: Pilot Charts* (Minutes 538, 632).—Read—M.O. 920 from the Controller of the Stationery Office stating that, in view of the increased cost of producing the Pilot Charts, he wished to have a statement of the reasons for increasing the number of official copies.

The Secretary was directed to draw up and forward a statement as desired by the Controller.

654. —— *Presentation Copies.*—(1) At the request of E. J. Allen, D.Sc., Director of the Marine Biological Association (M.O. 1,142) it was agreed that a copy of the Daily Weather Report be sent to the Laboratory of the International Fishery Investigation at Lowestoft; also back numbers of the report and of the monthly, quarterly, and annual summaries as requested by Dr. Allen.

—— (2) It was agreed to present a copy of the Pilot Charts, as issued, to the K. Preussiches Meteorologisches Institut, Berlin, at the request of Dr. Hellmann (M.O. 1,133), and the back numbers from May, 1902, if they can be spared.

655. *Fishery Barometers.*—Submitted—A meteorological diagram forwarded by the Harbour Master, Galway (M.O. 1,156), with the suggestion that it should be adopted by the Council in place of the fishery barometer diagram.

The Secretary was directed to return the thanks of the Council for the diagram.

656. *Valencia* (Minute 627).—At the suggestion of the Chairman it was resolved that a gratuity of four weeks wages be given to J. Walsh upon his leaving the service of the Observatory.

657. Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of April 1903 :—

The letters used have the following signification :—

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	57	54	56	
"	b	37	30	33	89
"	c	6	13	10	
"	d	0	3	1	
Scotland, E.	a	60	63	62	
"	b	33	20	26	88
"	c	7	17	12	
"	d	0	0	0	
England, N.E.	a	50	67	59	
"	b	40	30	35	94
"	c	7	3	5	
"	d	3	0	1	
England, E.	a	53	57	55	
"	b	33	37	35	90
"	c	7	3	5	
"	d	7	3	5	
Midland Counties	a	44	60	52	
"	b	40	34	37	89
"	c	13	3	8	
"	d	3	3	3	
England, S.	a	43	64	54	
"	b	40	30	35	89
"	c	10	3	6	
"	d	7	3	5	
Scotland, W.	a	60	70	65	
"	b	30	20	25	90
"	c	10	3	7	
"	d	0	7	3	
England, N.W.	a	57	73	65	
"	b	30	20	25	90
"	c	13	7	10	
"	d	0	0	0	
England, S.W.	a	53	63	58	
"	b	33	27	30	88
"	c	7	10	9	
"	d	7	0	3	
Ireland, N.	a	47	57	52	
"	b	27	37	32	84
"	c	20	6	13	
"	d	6	0	3	
Ireland, S.	a	40	67	54	
"	b	44	30	37	
"	c	13	3	8	91
"	d	3	0	1	
SUMMARY.					
British Islands	a	51	63	57	
"	b	35	29	32	89
"	c	11	6	9	
"	d	3	2	2	

658. *Accounts.*—Submitted—The following Statement of Accounts for the year ending 31st March, 1903 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1901–1902	—	2,464 19 7	Administration :		
Parliamentary vote ...	—	15,300 0 0	Council	850 16 8	
Repayment of expenses charged under—			Secretary	625 0 0	
(1.) Incidental expenses	31 13 0		Salaries and wages ...	1,053 9 11	
(2.) Observatories ...	23 4 0		Rent, fuel, and lighting	725 9 8	
(3.) Telegraphic Reports	2 0 0		Incidental and contingent expenses ...	296 18 10	
(4.) Special Researches	234 18 0		Furniture and fittings	394 3 11	
		291 15 0			3,945 19 0
Supply of Information :			Special Researches :		
Weather Forecasts, Reports, &c. ...	666 15 5		Salaries and other charges	—	1,038 13 2
Telegrams sent abroad	552 15 1		Land Meteorology :		
		1,219 10 6	Observatories and stations, including remuneration of observers	2,279 8 8	
Supply of Instruments, &c. :			Salaries :—Discussion and reduction of observations, &c. ...	1,540 0 8	
Repayment of cost of M.O. instruments purchased by observers	91 16 0				3,819 9 4
Repayment of cost of other commissions...	187 4 1		Weather Information and Forecasts :		
		279 0 1	Telegraphic reports and storm warnings, remuneration of observers, &c.	3,111 18 9	
Charges for Commission :			Salaries:—Preparation and issue of reports and forecasts ...	1,522 11 4	
On supply of instruments, &c.	—	6 1 1			4,634 10 1
			Inspections :		
Superannuation Account :			Salaries and travelling expenses	—	429 8 5
Annuity	140 15 9		Ocean Meteorology :		
Interest on Investment	50 18 2		Salaries :—Discussion and reduction of observations... ...	1,376 7 4	
		191 13 11	Expenses incidental to the supply of instruments :—		
			Proportion for care and issue of instruments	160 0 0	
			Royal Navy ...	469 8 2	
			Mercantile Marine and Stations ...	460 4 5	
			Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	208 2 1	
					2,674 2 0
			Superannuation :		
			Pensions and allowances	684 15 9	
			Invested	750 0 0	
					1,434 15 9
			Balance :		
			Cash at Bank	1,730 9 1	
			„ at Office ...	45 13 4	
					1,776 2 5
		£19,753 0 2			£19,753 0 2

Liabilities.	£ s. d.	Assets.	£ s. d.
To sundry creditors	504 3 8	By cash at Bank and at Office ...	1,776 2 5
„ balance	1,745 7 4	„ sundry debtors	473 8 7
	£2,249 11 0		£2,249 11 0

Note.—On March 31st the amount of 2½ per cent. Annuities held by the Council for the provision of Superannuation Annuities was £2,368 6*s.* 5*d.*

659. *Anemograph Stations: Holyhead.*—Reported—That the tube of the Dines' anemometer, which had buckled (see M.O. 1,213), had been straightened at the Dublin Steam Packet Company's workshops, through the courtesy of Capt. Kendall, and had been replaced ; that Mr. Curtis, who had visited the anemometers on his return from attending the trial of an action at Dublin, reported that it was desirable that the tube should be strengthened.

It was agreed to ask Mr. Cotton to have the tube strengthened by a collar and tie ropes.

660. *International Balloon Ascents: Cloud Observations* (Minute 612).—Read—M.O. 1,075 from the Astronomer Royal, expressing his willingness to co-operate in a scheme of observations as far as he could.

661. *Logs: Storage.*—Submitted—A memorandum from the Marine Superintendent respecting the storage of logs and other registers, which had now reached 11,250.

The Secretary was directed to ascertain what decisions had been arrived at on previous occasions.

662. *Logs.*—Six received, none excellent ; one short log.

663. *Storm Warnings* :—

The signals were hoisted on 2 days, the total number of districts warned being 5.
In 2 districts the warnings were justified by subsequent gales (force 8 or more), and in 1 district by subsequent strong winds (force 7 or 6) ; in 2 districts they were not required.

Gales experienced, for which no Warnings were issued.—None.

FRED. J. BRODIE.

664. *Accounts.*—Submitted—The following statement :—

	£	*s.*	*d.*
Cash balance on 21st April	5,247	6	7
Receipts from 22nd April to 7th May	437	15	9
	5,685	2	4
Cheques drawn from 22nd April to 7th May ...	745	19	7
Cash balance on 7th May	£4,939	2	9

665. Reports of work for the month of April were submitted and approved.

A list of publications received since last meeting was laid on the table.

63, *Victoria Street, S.W.*, 22*nd May*, 1903.

PRESENT :

PROFESSOR DARWIN, IN THE CHAIR.

MR. BUCHAN. | THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

666. The Minutes (642–665) of the last meeting, 8th May, were read and confirmed.

667. *Annuity for Mr. Gaster* (Minute 644).—Reported—that in accordance with the resolution of Minute 644 the corporate seal had been affixed on 12th May to a power of attorney to the Bank of England to transfer £1,862 15*s.* 6*d.*, 2½ per cent. annuities, to the National Debt Commissioners, and that a certificate of the transfer had been received from the Commissioners.

Resolved—that power of attorney be given to the bank to receive the quarterly payments on behalf of the Council and that the corporate seal be affixed to the necessary documents in the prescribed manner.

668. *Office Staff* (1).—The following promotions were approved to date from June 1st :—

Mr. C. H. Thompson, third class clerk, to a second class clerkship.
Mr. A. H. Bell, fourth class clerk, to a third class clerkship.

—— (2).—The appointment of Mr. A. T. Bench, formerly boy clerk, aged 21 years, to a fourth class clerkship for one year on probation, the continuation of the appointment being conditional upon his becoming proficient in telegraphy and typewriting was approved, the appointment to date from April 1st, 1903, the date of lapse of tenure of the boy clerkship under the regulations.

—— (3).—The Secretary was authorised to prepare a scheme for the computation of the additional payments to the members of the forecast staff in regular attendance outside the ordinary office hours as a percentage of the annual salaries payable in equal monthly instalments to replace the scheme of computation prescribed in Minute 104, xiii., and to come into operation as from 1st June, 1903.

669. *International Telegraphic Service* (Minute 646).—The Secretary was directed to inquire of the Admiralty whether the Coast Guard would be available for observing at 6 a.m. if satisfactory conditions were proposed.

The further consideration of the subject was postponed.

670. *Royal Meteorological Society—Kite Experiments* (Minute 650).—The Secretary reported that he had drawn up notes of particulars with regard to the requirements in respect of a steam vessel in consultation with Mr. Dines who had seen Capt. Tizard with regard to them.

It was agreed that the notes be sent to the Secretary of the Royal Society (P.C. 1,461).

671. *International Committee—Exhibition at Southport* (Minute 624).—The Secretary reported proceedings at a meeting of the Exhibition Committee on May 19th and asked for authority to pay the charges for carriage of exhibits to and from Southport.

Sanctioned.

672. *Wireless Telegraphy* (Minute 591).—The Secretary reported that he understood from Colonel Hozier that the Marconi Company required payment at the rate of 6*d.* per word for the transmission of a message from ship to shore.

673. *International North Sea Investigation.*—Read—the following letters and memorandum :—

M.O. 1,224.

Marine Biological Laboratory,
Plymouth,
11th May, 1903.

DEAR SIR,

IN connection with the International Fishery Investigations, it is proposed to make arrangements for the taking of surface temperatures of the sea, and for the collection of samples of sea-water and of the plankton organisms found at the surface, from certain lightships and lighthouses around the coast.

As the Council of the Association understands that certain similar observations, more especially of temperature, are already being taken on certain of the lightships for the Meteorological Council, they desire me, before approaching the lighthouse authorities, to consult with you with a view to avoiding any overlapping or duplication of the work. I enclose a list of light-vessels from which we desire, in the first instance, to have observations and samples, and also a copy of the directions for taking observations and samples which we propose to issue.

I should be glad to hear from you as to whether any arrangement could, in your opinion, be made between the Association and the Meteorological Council, based possibly upon an exchange of observations, which would prevent any duplication of work.

I am, &c.,
E. J. ALLEN,
Secretary.

W. N. Shaw, Esq., F.R.S.,
Meteorological Office.

STATIONS AT WHICH IT IS DESIRED TO COLLECT SAMPLES AND OBSERVE TEMPERATURES.

Bahama Bank Lightship.
Selker Rocks Lightship.
Carnarvon Bay Lightship.
Seven Stones Lightship.
Casquets.
Jersey.
Shambles Lightship.
Owers Lightship.
Royal Sovereign Shoal Lightship.
Varne Lightship.
East Goodwin Lightship.

DIRECTIONS FOR TAKING WATER SAMPLES AND TEMPERATURES.

1. Water samples should be taken at spring and neap tides.

2. All water samples and temperatures should be taken at half flood tide.

3. The water should be drawn, well forward of any discharge from the ship, in a bucket, preferably of wood or canvas. The bucket should be rinsed out with the sea-water several times before finally filling it. One of the bottles provided is then to be rinsed out with the sea-water at least twice, filled and corked. The date and time of taking the sample should be written on one of the labels provided, in lead pencil, and the label tied to the bottle.

4. The temperature of the water should be taken as frequently as possible, at half flood, with the thermometer provided, and the results entered on the forms provided. It is desirable that the temperature should be taken at least every 24 hours.

5. A canvas or wooden bucket should be used for taking temperatures, not a metal one.

6. The water samples and records of temperature should be sent ashore in the relief boats, together with the plankton samples, and forwarded to The Director, Marine Biological Laboratory, Plymouth.

DIRECTIONS FOR TAKING PLANKTON SAMPLES.

1. The samples are to be taken once every fortnight at spring tides.

2. In case of bad weather the samples are to be taken as soon after the proper time as circumstances will allow.

3. The net provided is to be hung in the tide-way at half-flood tide, and allowed to remain with the tide running through it for half-an-hour.

4. The net should be let out with sufficient rope to allow it to float just under the surface of the water.

5. When taken from the water, the end of the net must be turned inside out, and the material caught in it, which will have mostly collected at the end, washed out into sea-water placed in the bottles supplied.

6. A measured quantity of formalin is next to be added to the water containing the sample.

7. A slip of paper with the date, time, and locality written with a lead pencil, is to be placed *inside* the sample bottle.

8. The bottle should be stoppered and packed ready for transport. All samples should be sent ashore in the relief boats, together with the water samples, and forwarded to The Director, Marine Biological Laboratory, Plymouth.

M.O. 1,255.

Dundee,
14th May, 1903.

MY DEAR SHAW,

I HAVE been given charge of the Scottish portion of the International North Sea Investigations, under our Fishery Board, as Garstang and Allen have of the English work under the M.B.A. You probably know something of the scheme of work proposed for us; it includes many things, far more than we shall ever complete in the time provisionally allotted to us; but one of the first and most definite things to be undertaken is a study of the sea-temperature and other hydrographical conditions. Under this head, each country undertakes a series of special hydrographical cruises, and at the same time engages to gather, from the Captains of liners, from coast stations and otherwise as many supplementary observations as possible. We in Scotland have been receiving since last January a large and increasing number of such observations, from all our principal lines of steamers, from our only two lightships, and from a few lighthouse stations.

In delimiting the work between the M.B.A. and ourselves, it is now proposed that we in Scotland should extend our area (for hydrographic work only) as far south as the Thames, in order to leave the Plymouth people free to extend further to the westward than was contemplated under the original programme. And accordingly I am exceedingly anxious to get observations from the English east coast lightships.

Now I believe that your Council already receives such observations from these lightships; will you tell me to what extent, and of what degree of accuracy? I should be exceedingly glad if we could combine forces and share results.

We supply all our people with good thermometers, graduated to ·1° C., and we ask for two readings a day from our Scottish lightships, one at high-water and one at low. The returns sent us up to the present are excellent. We should be very glad to supply the same thermometers to your English lightships if you would not think us encroaching on your province, and to give you, or get from you, duplicates of the observations. It is quite plain that it is only from the lightships that we can have any trustworthy reports on our coast waters. The inshore steamer routes, *e.g.*, Leith to London, are altogether inadequate, and the tidal fluctuations confuse their readings beyond all remedy.

I wish I could come and see you to talk over this, and indeed, I have been anxious to do so for some time past; but I have lately been unable to spare time to come up to town. Now I hear that your Council meets next week—I happened to see Buchan yesterday in Edinburgh, who told me so—and so perhaps the time is opportune to broach and discuss the matter.

Most of our hydrographic work will be in the hands of a young chemist, A. J. Robertson, lately with Thorpe. He has just returned from four months of preparatory coaching abroad, principally in Bergen and Christiania. He is a very good man, and did himself great credit while he was abroad.

Yours very faithfully,
D'ARCY W. THOMPSON.

22nd May, 1903.

IN reference to letters M.O. 1,224 and 1,255 from the Marine Biological Association of the United Kingdom, and from the International Committee for Investigation of North Sea (Scotland) respectively, in which the co-operation of this Office is solicited, may I be permitted to suggest the desirability of such co-operation in collecting observations, not only of sea surface temperature, but also of salinity, from vessels traversing the North Atlantic, as well as from the light-vessels off our coasts?

Observations for salinity would tend to confirm any meteorological inferences to which those for sea surface temperature might point.

C. H.

The Secretary was directed to inform Dr. Allen and Professor D'Arcy Thompson as to the nature and extent of the observations received by the Office.

674. *Instruments:*—

RETURN of SERVICEABLE INSTRUMENTS in the OFFICE and at HIS MAJESTY'S DOCKYARDS for the QUARTER ending 31st MARCH, 1903.

Place.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available 1st Jan., 1903	91	151	193	84	86	54
	Received, new	—	—	—	—	—	20
	„ repaired and cleaned.	28	10	10	—	—	—
	Total	119	161	203	84	86	74
	Issued	24	51	115	23	25	19
	Total available 1st Apr., 1903.	95	110	58	61	61	55

RETURN of ADMIRALTY INSTRUMENTS for the QUARTER ending 31st MARCH, 1903.

Depôts.	BAROMETERS.								THERMOMETERS.															
	Mercurial.				Aneroid.				Ordinary.				Maximum.				Minimum.				Screens.			
	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.
†Portsmouth	25	23	—	2	55	55	—	—	150	143	—	7	50	60	10	—	50	64	14	—	25	21	—	4
†Devonport	25	19	—	6	55	35	—	20	150	114	—	36	50	40	—	10	50	41	—	9	22	19	—	3
†Chatham	25	17	—	8	55	42	—	13	150	123	—	27	50	45	—	5	50	52	2	—	25	17	—	8
†Sheerness	6	5	—	1	15	14	—	1	30	29	—	1	10	10	—	—	10	10	—	—	10	10	—	—
†Queenstown	5	5	—	—	10	9	—	1	15	19	4	—	8	8	—	—	8	8	—	—	—	3	3	—
(Dockyards, Home) Total	86	69	—	17	190	155	—	35	495	428	4	71	168	163	10	15	168	175	16	9	82	70	3	15
Gibraltar	2	2	—	—	2	2	—	—	4	8	4	—	3	2	—	1	3	2	—	1	—	—	—	—
†Malta	11	9	—	2	15	16	1	—	60	55	—	5	10	10	—	—	10	11	1	—	1	2	1	—
Bombay	4	2	—	2	3	1	—	2	10	4	—	6	4	—	—	4	4	2	—	2	1	2	1	—
Halifax	3	2	—	1	4	4	—	—	20	13	—	7	4	4	—	—	4	2	—	2	1	1	—	—
†Bermuda	3	4	1	—	4	5	1	—	20	20	—	—	4	4	—	—	4	5	1	—	1	1	—	—
Jamaica	3	2	—	1	2	5	3	—	10	10	—	—	2	—	—	2	2	1	—	1	1	1	—	—
Cape of Good Hope	7	4	—	3	8	9	1	—	33	32	—	1	8	8	—	—	8	6	—	2	2	2	—	—
Trincomali	3	2	—	1	3	2	—	1	10	14	4	—	4	5	1	—	4	4	—	—	1	1	—	—
Hong Kong	17	10	—	7	21	12	—	9	87	60	—	27	21	17	—	4	21	22	1	—	5	11	6	—
†Sydney	5	—	—	5	6	8	2	—	25	21	—	4	6	5	—	1	6	5	—	1	1	1	—	—
*Esquimalt	4	5	1	—	5	13	8	—	15	30	15	—	2	3	1	—	2	5	3	—	1	3	2	—
(Dockyards, Abroad) Total	62	42	2	22	73	77	16	12	294	267	23	50	68	58	2	12	68	65	6	9	15	25	10	—
Grand Total and Net Shortage at Depôts	148	111	—	**37**	263	232	—	**31**	789	695	—	**94**	236	221	—	**15**	236	240	**4**	—	97	95	—	**2**
Meteorological Office... ...	45	**95**	50	—	120	**110**	—	10	250	**58**	—	192	80	**61**	—	19	80	**61**	—	19	50	**55**	5	—
Repairing	—	—	15	—	—	—	15	—	—	—	9	—	—	—	6	—	—	—	21	—	—	—	—	—
Returnable from Depôts ...	—	—	20	—	—	—	26	—	—	—	35	—	—	—	4	—	—	—	6	—	—	—	—	—
Ordered	—	—	—	—	—	—	—	—	—	—	198	—	—	—	20	—	—	—	20	—	—	—	—	—
Net Surplus or Shortage at M.O.	—	—	85	—	—	—	31	—	—	—	50	—	—	—	11	—	—	—	28	—	—	—	5	—
Proposed to be Ordered ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

21st May, 1903.

* Instruments at Coquimbo have been debited to Esquimalt. † Supplies forwarded since 31st March, 1903.

NOTE.—No change has occurred in the Stocks of Hydrometers.

R. F. WALLACE.

675. *Instruments—Mercantile Marine—Barometers* (Minutes 630, 651).—Authority was given to order 6 M.O. Barometers, Marine pattern.

676. —— *Land Stations Abroad.*—Authority was given for the loan of instruments for a station during the winter on Southampton Island in about Lat. 63° 10′ N. Long. 86° W. in charge of Capt. J. W. Murray. (M.O. 1,254).

677. *Publications—Hourly Values* (Minute 555).—Submitted—Specimens of tables of hourly values of pressure (first figure omitted), dry bulb, wet bulb, wind, rainfall, sunshine, daily means, and anemographic readings in old style nonpareil ; also specimens of tables of hourly values of pressure and temperature in old style brevier with mean values in nonpareil.

The latter were approved, and the Secretary was authorised to proceed with the compilation of the volume of hourly readings and to submit a complete specimen of a month's values.

678. *Registrar-General's Returns.*—Reported— the receipts of copies of the Registrar-General's Quarterly Return containing the meteorological report drawn up in the Office in accordance with Minutes 334, 359, 477. Reported also that the form of table had been adopted by the Registrar-General for Ireland, and, with unimportant modifications in details, by the Registrar-General for Scotland.

679. *Forecast Districts* (Minute 597).—The Secretary reported that he had ascertained that Mr. Gaster was willing to attend at the Office for a fixed period each day to commence the investigation indicated in Minute 597, and that in consideration of his practical knowledge of the subject it was very desirable that he should undertake the work if his health permitted ; that he had accordingly entrusted the investigation to Mr. Gaster on the understanding that the payment to him will be at the rate of £100 for the year terminating on 31st March next, and that the work will continue to that date if it is found he is able to carry it on satisfactorily.

Approved.

680. *Observatories—Valencia.*—Reported—that Mr. Cullum had engaged a new messenger at 15*s.* per week from 3rd May. (M.O. 1,205.)

Approved.

681. *Logs—Storage* (Minute 661).— The Secretary was authorised to make the necessary arrangements.

682. *Logs.*—Seven received, two excellent. One short log.

683. *Storm Warnings:*—

Signals hoisted on 3 days ; total number of districts warned, 12.
In 3 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 5 districts by subsequent strong winds (force 7 or 6). In 4 districts they were not required.

Gales experienced, for which no Warnings were Issued.—None.

684. *Accounts—Audit.*—Reported—That the cash accounts for the quarter ended the 31st March last had been this day examined by Prof. Darwin and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st January last, when there was a balance of £1,610 14*s.* 1*d.*, were £5,348 14*s.* 3*d.* against £5,452 13*s.* 1*d.* in the corresponding period of the preceding financial year. The payments were £5,183 5*s.* 11*d.* against £4,997 12*s.* 3*d.* during the same period in the previous year. The balance in hand and at the bank on the 31st March, amounted to £1,776 2*s.* 5*d.*, and at the same date in 1902 to £2,464 19*s.* 7*d.* The sums invested in Consols for the two years were respectively £2,368 6*s.* 5*d.*, and £1,576 16*s.* 4*d.*

685. *Accounts.*—Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 7th May	4,939	2	9
Receipts from 8th to 21st May	34	18	4
	4,974	1	1
Cheques drawn from 8th to 21st May	164	8	8
Cash balance on 21st May	£4,809	12	5

686. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 5th June*, 1903.

PRESENT :

SIR R. STRACHEY (IN THE CHAIR).

PROFESSOR DARWIN. | THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

687. The Minutes (666–686) of the last meeting (22nd May) were read and confirmed.

688. *Annuity for Mr. Gaster* (Minute 667).—The Corporate Seal was affixed to a power of attorney to the Bank of England to receive the quarterly instalments of the annuity on behalf of the Council.

689. *Forecasts for Electric Lighting Departments.*—Read—M.O. 1,413 from the resident engineer of the Electricity and Public Lighting Department, St. Pancras Borough Council, asking for notification, within an hour, of the approach of sudden darkness or storms.

The Secretary was directed to reply, explaining to what extent the forecasts issued by the Office could be utilised for the purpose of anticipating the conditions under which darkness is likely to occur in the daytime.

690. *Deutsche Seewarte: Pilot Charts for North Sea and Baltic.*—Read—M.O. 1,398 asking for monthly statistics of fog at coast stations in the British Isles.

The Secretary reported that there were no official statistics of the prevalence of fog ; that the only statistics known in the Office were " Fifteen Years' Fogs in the British Isles, 1876–1890," by Mr. Scott, Q.J., R. Met. Soc., Vol. XIX., and " Fogs on the Coast of Scotland," by Dr. Buchan, Jour. Scott. Met. Soc., Vol. XII.

The Hydrographer undertook to report about the compilation of statistics of fogs undertaken by the Hydrographic Office from the Trinity House records.

691. *Telegraphic Reporting Stations discontinued* (Minute 596).—The Secretary was directed to offer to Mr. Berridge, of Loughborough, who had personally reported 8 a.m. observations without intermission for upwards of 20 years, and to Mr. T. G. Benn, of Newton Reigny, who had sent telegraphic reports for some years without payment, a bound copy of one of the Office publications with a suitable inscription.

692. *Office Staff.*—(1) Reported—A reply (M.O. 1,338) from the Post Office regretting the Postmaster-General's inability to comply with the request of the Council for the loan of the services of a telegraphist to receive the telegrams sent to the Office (Minute 610 (2)).

—— —— (2) Resolved—(i.) That the additional payments to members of the staff of the forecast branch in regular attendance outside the ordinary Office hours be computed until further order as follows, and paid in equal monthly instalments :—

For three forecasters, at 13 per cent. of the fixed annual salary to include 13 weeks' early attendances, 13 weeks' late attendances, and 13 Sundays for each.

For two telegraphists, at 24 per cent. of the fixed annual salary to include for each 23 weeks' early attendances, 24 weeks' late attendances, and 24 Sundays.

For two assistants, at 12 per cent. of the fixed or computed annual salary to include 23 weeks' early attendances, 24 weeks' late attendances.

(ii.) That the attendance of substitutes for members of the staff of the forecast branch on leave be paid for at the present rates (Minutes 104, xiii.).

(iii.) That, until further order, the Secretary be authorised to employ at his discretion Mr. Brodie for additional services to an extent not exceeding £25 per annum, and Mr. Sargeant to an extent not exceeding £20 per annum (inclusive of payments for attendances in the absence of a telegraphist) in consideration of the fact that their hours of special attendance have been for many years past considerably greater than are required under the new arrangements in the case of forecasters.

(iv.) That the Secretary be authorised to arrange for the attendance of assistants on Sunday evenings (6–9) in lieu of Saturdays (1–8.30).

—— —— (3) The Secretary reported that he had appointed Miss M. E. Clowes, one of the additional female clerks under Minute 610 (3), on probation for one year at a salary of £50 per annum, payable monthly, the arrangement to be terminable at the end of June if thought desirable, or subsequently by a month's notice.

693. *Publications: Colonial and Foreign Observations.*—The Secretary reported that Dr. Ravenstein had prepared abstracts of observations in Africa, in continuation of the reports on African Meteorology presented to the British Association, as follows :—

British East Africa ...	11 Stations ...	Monthly Summaries,	1901–2.
Egyptian Soudan ...	8 „ ...	„ „	1902.
Congo State	1 Station ...	„ „	1902.
Nyasaland	4 Stations ...	„ „	1901–2.
	With Summary of barograph records.		
Rhodesia	12 Stations ...	Monthly Summaries,	1900–1.
Lower Zambesi, Mopea	11 Years' Summary.		
	Also a Summary of rainfall.		

It was resolved that the abstracts be issued as a colonial supplement to the quarto publications of the Office, separately paged.

694. —— *Presentation Copies.*—At the request of A. J. Herbertson, Curator (M.O. 1,424), it was resolved to present a copy of the Pilot Charts, as issued, to the School of Geography, Old Ashmolean Building, Oxford.

695. *Instruments, Royal Navy.*—The Secretary reported that he had complied with a demand for instruments from the Portsmouth Observatory, although it exceeded the shortage on the establishment there, and that he had called the attention of the Superintendent of Chronometers to the difference.

Approved.

696. *Forecasts*, 8.30 *p.m.*—Monthly report for May, 1903 :—

The letters used have the following signification :—
a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	55	81	68	91
"	b	32	13	23	
"	c	7	0	3	
"	d	6	6	6	
Scotland, E.	a	71	78	75	94
"	b	20	19	19	
"	c	3	3	3	
"	d	6	0	3	
England, N.E.	a	61	58	60	87
"	b	29	26	27	
"	c	3	10	7	
"	d	7	6	6	
England, E.	a	58	61	60	86
"	b	16	36	26	
"	c	23	3	13	
"	d	3	0	1	
Midland Counties	a	65	58	62	86
"	b	16	32	24	
"	c	16	7	11	
"	d	3	3	3	
England, S.	a	61	58	60	91
"	b	23	39	31	
"	c	16	3	9	
"	d	0	0	0	
Scotland, W.	a	58	78	68	88
"	b	23	16	20	
"	c	13	0	6	
"	d	6	6	6	
England, N.W.	a	55	81	68	88
"	b	29	10	20	
"	c	13	3	8	
"	d	3	6	4	
England, S.W.	a	52	61	57	87
"	b	32	29	30	
"	c	10	10	10	
"	d	6	0	3	
Ireland, N.	a	49	71	60	83
"	b	29	16	23	
"	c	16	7	11	
"	d	6	6	6	
Ireland, S.	a	48	65	57	81
"	b	19	29	24	
"	c	23	3	13	
"	d	10	3	6	
Summary.					
British Islands	a	58	68	63	87
"	b	24	24	24	
"	c	13	5	9	
"	d	5	3	4	

697. *Instruments for Stations.*—The Secretary was instructed to suggest to the Director of the National Physical Laboratory the desirability of making arrangements for the testing of ordinary meteorological instruments at Edinburgh and Dublin, and possibly at other centres, and to confer with him upon the matter.

698. *Logs.*—Eight received, one excellent (Capt. J. W. Millican). Three short logs.

699. *Warnings.*—None issued; no gales experienced.

700. *Accounts.*—The payment of £1 17*s.* 4*d.* freight, &c., of instruments sent out to New York for Captain Eagleton, S.S. Trojan Prince, trading between Genoa and New York, was authorised.

701. *Accounts*—Submitted—The following statement:—

	£	*s.*	*d.*
Cash balance on 21st May	4,809	12	5
Receipts from 22nd May to 4th June	37	14	8
	4,847	7	1
Cheques drawn from 22nd May to 4th June ...	826	13	4
Cash balance on 4th June	£4,020	13	9

702. *Reports of Work* for the month of May were submitted and approved.

703. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W.*, 19*th June*, 1903.

PRESENT:

SIR R. STRACHEY (IN THE CHAIR).

MR. BUCHAN. | PROFESSOR DARWIN.

MR. SHAW (*Secretary*).

704. The Minutes (687–703) of the last meeting (5th June) were read and confirmed.

705. *Inland Hydrographic Work.*—Read—The following letter and enclosures:—

M.O. 1,624.

Foreign Office,
16th June, 1903.

SIR,

I AM directed by the Marquess of Lansdowne to transmit to you the accompanying copy of a Note from the American Ambassador, enclosing a despatch from Mr. Hay, the United States Secretary of State, in which he asks that certain information may be obtained for a bulletin, descriptive of the hydrographic work carried on by the various European Governments and by Japan, which the Hydrographic Division of the American Geological Survey is preparing.

The Board of Education, to whom the matter has been referred in the first instance, have stated, with regard to paragraph 3 of Mr. Hay's despatch, that information on rainfall and cognate subjects is collected and published by the Meteorological Council, and have suggested that application should be made to you for such information.

I am to request that you will move the Meteorological Council to supply such information as may be available and they may consider useful for communication to the American Embassy.

I am, &c.,
F. H. VILLIERS.

Dr. W. N. Shaw, F.R.S.,
Secretary to the Meteorological Council,
63, Victoria Street, S.W.

American Embassy, London,
8th May, 1903.

MY LORD,

I HAVE the honour to enclose herewith the copy of a despatch which I have received from my Government, asking me to obtain certain information, therein set forth, for a Bulletin, descriptive of the hydrographic work carried on by the various European Governments, and by Japan, which the Hydrographic Division of the Geological Survey is preparing, with a view to the improvement of the methods at present used in the United States in that line of work by the General Government, by the State Governments, and by individuals.

I shall be much obliged if Your Lordship will be so good as to cause to be transmitted to me such portions of the desired information as may be obtainable.

I have, &c.,
(Signed) JOSEPH H. CHOATE.

The Marquess of Lansdowne, K.G.,
&c., &c., &c.

Department of State,
Washington,
27th April, 1903.

SIR,

THE Secretary of the Interior, under date of the 21st inst., forwards a report from the Acting Director of the Geological Survey, stating that the Hydrographic Division of the Survey is preparing a Bulletin describing the hydrographic work carried on by the various European Governments, and by Japan, with a view to the improvement of the methods at present used in this country in that line of work by the General Government, by the State Governments, and by individuals.

To that end the Survey would be glad to receive information upon the subject from the Foreign Governments referred to. It would be glad to secure, if possible, copies of all reports relating to the matter published by the Government to which you are accredited, and also copies of all reports published by any political divisions of the Government.

What is particularly desired is complete and full information regarding the methods of measuring the flow of the rivers of the various countries, the instruments used for this purpose, methods of operation and of computation; methods of studying rainfall, evaporation, and seepage; methods of the general study of water powers by the Government, that is, extent of surveys made, scale of same, instruments used, and method of publishing results; also methods of sanitary investigations by the General Government upon the rivers, including the methods of chemical, biological, and microscopic examination of the water of flowing streams.

Information in regard to hydraulic experiments carried on by the Governments, with the results and methods of publication, would also be of interest.

Many individual engineers are making examinations as specified above, but it is more particularly the work carried on by the States and Nations that is desired, as this will be of the greatest use in the hydrographic investigations of the United States.

You are instructed to use your good offices to secure the desired information.

The Consuls of the United States in Canada and India will be instructed to obtain the information desired as far as relates to their Consular districts.

I am, &c.,
(Signed) JOHN HAY.

His Excellency, Joseph H. Choate,
&c., &c., &c.

The Secretary was authorised to make inquiry and report upon the matter.

706. *Marine Observations, China Seas and North Sea.*—Read—M.O. 1,612 from Capt. Schück, Hamburg, asking for permission to attend at the Office and "make extracts from written and printed documents about the China Seas, Japan waters, Western North Pacific to 180° E., and the months of July, August, September, and October of the North Sea."

The Secretary was authorised to give the facilities asked for by Capt. Schück.

707. *Instruments for the Admiralty.*—The Secretary reported that at the request of the Hydrographer (M.O. 1,537) he had given directions for two mercurial barometers and four ordinary thermometers to be sent to Bermuda, and for the establishment of mercurial barometers at that depôt to be increased from three to four.

Approved.

708. *Halliwell's Self-Recording Rain-gauge* (Minute 361).—Read—M.O. 1,594 from Mr. Halliwell stating that he had introduced several minor improvements in the instruments more recently constructed, and that if the Council purchased the instrument now on trial on the Office roof, he would make the alterations in it.

Traces obtained from the gauge were submitted, and it was resolved to purchase the instrument and to accept Mr. Halliwell's offer to add the more recent improvements.

It was further resolved that inquiry be made as to a site for exposure of the gauge more suitable for such a purpose than the roof of the Office.

709. *Publications, Presentation Copies.*—It was resolved to send copies of the current publications of the Office to the "Bureau du conseil international pour l'exploration de la mer," Copenhagen, in exchange for publications of the Bureau upon the application of P. P. C. Hoek, General Secretary (M.O. 1,613).

710. —— *S. S. O. Volume.*—The Secretary submitted forms for tables of values from the self-recording instruments at certain observatories and stations for which daily observations at 9 a.m. and 9 p.m. are published in the S. S. O. volume which would increase the space occupied in the volume from one half-page to a whole page per month for each of these stations.

The forms were provisionally approved. It was agreed that the selection of hours for values other than 9 a.m. and 9 p.m. should be 4h., 8h., and 12h. in conformity with the practice in ships' logs and the lighthouse registers supplied by the Office; also 2 p.m. and 6 p.m., being hours of observation in connexion with the telegraphic reports.

The Secretary was authorised to obtain a specimen proof of eight pages arranged in the manner indicated.

He was also authorised to invite the Radcliffe Observatory, Oxford, to co-operate in the matter by supplying the material for a page per month of the publication in its revised form.

711. —— *Official Copies.*—Authority was given to apply to the Stationery Office for 75 additional official copies of No. 76 (Charts of Mean Barometric Pressure over the Atlantic, Indian, and Pacific Oceans), and to supply copies of the supplementary chart to complete the volumes if necessary (M.O. 1,642).

712. *Observatories, Fort William.*—Read—A memorandum (M.O. 1,643) from Mr. R. H. Curtis, reporting that the photographic sheets from Fort William had been unsatisfactory for some time past.

The Secretary was directed to forward a copy of the memorandum to the Directors of the Ben Nevis Observatories and ask them to look into the matter.

713. *Inspections.*—The Secretary was authorised to make arrangements for the inspection of observatories and stations by members of the Kew Staff, or of the Office Staff, in accordance with the arrangements approved in 1901 (Minute 91). The usual grant to the Royal Meteorological Society (Minute 80) of £25 for the inspection of stations upon the same terms as last year (Minute 365) was sanctioned.

714. *Logs.*—Nine received, two excellent; Capt. T. S. Angus and Capt. A. Simpson.

715. *Storm Warnings:*—

Signals hoisted on 1 day, total number of districts warned, 4.
In 1 district the warnings were justified by subsequent strong winds (force 7 or 6). In 3 districts they were not required.

Gales experienced for which no warnings were issued.—None.

716. *Accounts.*—It was resolved that £750 be invested in 2½ per cent. annuities as an addition to the reserve for superannuation (Minute 288).

717. *Accounts.*—Submitted—The following statement:—

	£	s.	d.
Cash balance on 4th June	4,020	13	9
Receipts from 5th to 18th June	49	8	3
	4,070	2	0
Cheques drawn from 5th to 18th June	166	1	2
Cash balance on 18th June	£3,904	0	10

718. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W.*, 1*st July*, 1903.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	THE HYDROGRAPHER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

719. The Minutes (704–718) of the last meeting, 19th June, were read and confirmed.

720. *International Telegraphic Service* (Minutes 646, 669).—Read—M.O. 1,669 from the Admiral Commanding the Naval Reserves stating that "so far as the Coast Guard is concerned, it will be quite as convenient to furnish the reports at 6 a.m. as proposed instead of at 8 a.m. as at present."

The Secretary was directed to forward a reply to the Seewarte, after consultation with the Chairman, stating that as the establishment of a 6 a.m. service would entail large additional expenditure the Council would desire further information as to the special advantages likely to accrue from such a service before taking steps to bring the matter before the Government, and that they would be in a better position to form an opinion on the question after the proposed discussion of the subject at the Southport meeting of the International Meteorological Committee.

721. *Colonial Observations—British East Africa* (Minute 582). — Read — the following letter :—

M.O. 1,655.

Foreign Office,
June 20th, 1903.

SIR,

WITH reference to the suggestion, contained in your letter of 11th March last, that Dr. Ruffelli Scott and other members of the Church of Scotland Mission should assist Dr. Johnson in his meteorological observations in the East Africa Protectorate, I am directed by the Marquess of Lansdowne to inform you that owing to the limited number of instruments in the Protectorate His Majesty's Commissioner considers it at present impossible to comply with Dr. Scott's request.

Lord Lansdowne is, however, asking the Lords Commissioners of His Majesty's Treasury for a grant of £100 per annum towards facilitating the work of obtaining meteorological returns in the East Africa Protectorate, and if this sum is granted his Lordship hopes that the returns sent from the Protectorate will in future be more complete.

I am, &c.,
CLEMENT LL. HILL.

The Secretary
to the Meteorological Office.

722. *Royal Meteorological Society—Kite Observations.*—It was agreed to supply instruments for a base station at Crinan Harbour in connexion with the continuation of the kite observations at Crinan on the same terms as last year. (Minutes 287, 314.)

723. *International Meteorological Committee—Proposed Exhibition of Instruments, &c., at Southport* (Minutes 624, 671).—The Secretary reported that at a meeting of the Exhibition Committee it was suggested that Mr. Marriott, Assistant Secretary of the Royal Meteorological Society, might be willing to go down to Southport for a week before the meeting of the Association and arrange the exhibits.

The payment of Mr. Marriott's expenses was authorised, provided they do not exceed £10.

724. *Harvest Forecasts.*—Submitted the following summary of the result of the checking of the Harvest Forecasts for 1902 by the recipients :—

CHECKING of HAY HARVEST FORECASTS, 1902, by the RECIPIENTS.

Districts and Names.	Number checked.	A. Complete success.		B. Partial success.		C. Partial failure.		D. Total failure.	
		No.	%	No.	%	No.	%	No.	%
ENGLAND, N.E.									
Grange Hill, Durham	30	12	40	8	27	9	30	1	3
ENGLAND, E.									
Goff's Oak	11	7	64	4	36	—	—	—	—
Lakenheath	12	9	75	3	25	—	—	—	—
Papworth Everard	25	12	48	13	52	—	—	—	—
Cley-by-Sea	36	18	50	12	33	5	14	1	3
Horningsey	21	15	71	5	24	—	—	1	5
Shipdham	24	10	42	13	54	—	—	1	4
For District	129	71	55	50	39	5	4	3	2
MIDLAND COUNTIES.									
Northfield	76	23	30	41	54	12	16	—	—
Lillington...	6	5	83	1	17	—	—	—	—
Shenstone	42	19	45	20	48	3	7	—	—
Stone Park	66	29	44	30	45	7	11	—	—
Oaksey	54	25	46	25	46	4	8	—	—
Staverton	12	5	42	5	42	2	16	—	—
Shrewsbury	18	11	61	4	22	3	17	—	—
Lingen	18	6	33	8	45	4	22	—	—
Ledbury	6	6	100	—	—	—	—	—	—
Wombourne	12	4	33	6	50	2	17	—	—
Ross	14	8	57	6	43	—	—	—	—
For District	324	141	44	146	45	37	11	—	—
ENGLAND, S.									
Lymington	6	3	50	3	50	—	—	—	—
Sturminster Marshall	12	8	67	4	33	—	—	—	—
Faversham	35	18	51	15	43	2	6	—	—
Sherborne	39	25	64	13	33	1	3	—	—
Bradfield	12	8	67	4	33	—	—	—	—
Reigate	9	6	67	3	33	—	—	—	—
Shorwell	12	7	58	5	42	—	—	—	—
Wareham	23	15	65	5	22	2	9	1	4
Reculver	12	7	58	3	25	—	—	2	17
Glynde	18	6	33	10	56	2	11	—	—
Staplehurst	46	40	87	6	13	—	—	—	—
For District	224	143	64	71	32	7	3	3	1
ENGLAND, N.W.									
Blackburn	25	16	64	6	24	3	12	—	—
Aynsome, Lancaster	36	23	64	8	22	4	11	1	3
Wern	82	41	50	36	44	5	6	—	—
Llandudno	86	46	54	32	37	8	9	—	—
Lancaster County Council Farm ...	24	14	58	9	38	1	4	—	—
Llanfyllin	30	12	40	17	57	1	3	—	—
For District	283	152	54	108	38	22	8	1	—
ENGLAND, S.W.									
Brynog	29	15	52	10	34	4	14	—	—
IRELAND, S.									
Glasnevin...	54	17	32	24	44	10	18	3	6
Total	1,073	551	51	417	39	94	9	11	1

The Secretary was directed to send a copy to Sir T. Elliott, Secretary of the Board of Agriculture.

725. *Publications—Hourly Readings.*—A proof specimen of a month's values for Valencia in pursuance of Minute 677 was submitted, amended and approved.

726. —— *Instructions in the use of Meteorological Instruments* (O. 24).—The Secretary reported that the copies of this publication were now exhausted and requested authority to prepare an abridged edition for immediate issue.

Sanctioned.

727. —— *Presentation Copies.*—Resolved—(1) that the Daily and Weekly Weather Reports be sent to University College, Dundee, on the application of Professor Kuenen. (M.O. 1,708.)

(2) That the volume of observations at First Order Stations be sent to the Observatorio Meteorológico del Colegio de Nuestra Señora del Recuerdo, Madrid, in exchange for the Boletín of the Observatory.

728. *Logs.*—Five received, one excellent (Capt. F. C. Mullan).

729. *Storm Warnings* :—

Signals hoisted on 1 day, total number of districts warned, 3.
On this occasion the warnings were not required.

Gales experienced, for which no Warnings were issued.—None.

730. *Accounts.*—(1) Reported the purchase of £820 14*s.* 9*d.* 2½ per cent. annuities in pursuance of Minute 716.

(2) Submitted—The following statement :—

	£	*s.*	*d.*
Cash balance on 18th June	3,904	0	10
Receipts from 19th to 30th June	33	8	8
	3,937	9	6
Cheques drawn from 19th to 30th June	2,218	15	2
Cash balance on 30th June	£1,718	14	4

731. *Reports of Work for June* for the Marine, the Observatory, and the Telegraphic Branches were submitted and approved.

732. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 21st October*, 1903.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	THE HYDROGRAPHER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

733. The Minutes (719–732) of the last meeting (1st July) were read and confirmed.

734. *International Meteorological Committee: Meeting at Southport.*—The Secretary submitted the following report :—

During the meeting of the British Association at Southport, meetings of the International Meteorological Committee were held as follows:—On Wednesday, 9th September, at 10 a.m. and 3 p.m., on Thursday, 10th September, Friday, 11th September, and Monday, 14th September, at 3 p.m., and on Tuesday, 15th September, at 10.30 a.m. Meetings of the Sub-Committee for International Telegraphy were held at 9 a.m. on Thursday, 10th September, Friday, 11th September, and Monday, 14th September, and informal meetings of the same Committee were held at other times. The Sub-Committee on Clouds presented its final report at the first meeting of the Committee; the Sub-Committees on Terrestrial Magnetism, on Solar Radiation, and on Aeronautics did not meet. The Committee arranged its meetings so as to enable the members to attend the meetings of the Sub-Section of the British Association for Astronomy and Meteorology, which were held on Friday, 11th September, Monday, 14th September, and Tuesday, 15th September. A number of members of the Committee made communications to the Section. On Saturday, 12th September, a large number of members of the Committee visited the Physical Laboratory of the Owens College, Manchester, upon the invitation of Professor Schuster.

A considerable number of the members of the Committee left Southport on Wednesday, 16th September, and were on that account unable to be present at a complimentary dinner given by the Mayor of Southport to meet the President of Association, Sir N. Lockyer, and the President of the International Committee, Professor E. Mascart.

Of the seventeen members of the International Committee eleven were present at Southport, viz.:—Professor Mascart (*President*), representing the Bureau Central Météorologique of France; Professor Hildebrandsson (*Secretary*), Sweden; Professor Mohn, Norway; Dr. Paulsen, Denmark; Dr. Snellen, Netherlands; Dr. Hellmann, Germany; Professor Pernter, Austria; General Rykatcheff, Russia; Major Chaves, Azores, Portugal; Professor Willis Moore, United States; and myself. Professor Billwiller, Switzerland, and Professor Palazzo, Italy, were prevented at the last moment from attending. The other members absent were Sir J. Eliot, India; Mr. W. G. Davis, the Argentine; Mr. Russell, New South Wales; and Professor Hepites, of Roumania.

Of the members of Sub-Committees, Professor van Bebber, of the Seewarte, Professor Hergesell, of Strasburg, Monsieur Teisserenc de Bort, of Paris, and Mr. A. L. Rotch, of Blue Hill, attended the meetings of the Committee.

The following subjects were discussed :—

1. Changes in the *personnel* of the Committee: M. Lancaster, of Brussels, was elected in place of Professor Snellen, who resigned.

2. Report of the Aeronautical Committee, with a proposition as to the publication of the results of the International ascents, which had been published hitherto by the German Government. The official report was followed by an account of various private enterprises in the same department, the most important of which was M. Teisserenc de Bort's account of the Franco-Scandinavian Station, which he established and worked in Jutland in 1902.

3. Final report of the Committee on Clouds, including the application of the results of cirrus observations to the question of the general circulation of the atmosphere. This is of considerable importance, as it does not support the theories of James Thomson and Ferrel.

4. The Sub-Committee on Terrestrial Magnetism reported that it would hold a meeting at Cambridge next year during the session of the British Association. It was resolved to urge Sir A. Rücker, who wished to resign, to remain President of the Committee.

5. The use of radio-active salts as collectors of atmospheric electricity (Paulsen & Mascart).

6. The desirability of including observations of the motion of clouds in the daily telegraphic reports from selected observing stations (Teisserenc de Bort).

7. The facilities afforded by the Meteorological establishment at the Azores (Chaves).

8. The desirability of instituting regular observations of radiation at first class observatories on the ground that Ångstrom's instrument afforded a satisfactory means of obtaining really comparable observations (Pernter).

This resolution was turned into a more general form as the Committee were unwilling to express an opinion on the relative merits of different instruments for observing radiation.

9. The employment of the hair hygrometer in lieu of the psychrometer (Pernter.) After a lively discussion this was dropped without arriving at any specific conclusion.

10. A proposal for the notification of "perturbed" magnetic days as well as "quiet" days was referred to the Magnetic Sub-Committee.

11. A proposal to establish a sub-committee to deal with questions of the relation between solar and terrestrial changes following on a discussion in Section A of the Association introduced by Sir N. Lockyer (Shaw). This was acquiesced in and Shaw, Pernter, Lockyer, Angot, Langley, were named as members to organise the proposed Committee.

12. A resolution, drafted probably by Schuster and produced by Mascart, calling attention of the British Association to the inconvenience of having two systems of units for meteorological quantities (Shaw). This was adopted after some attempt to change the form of the resolution to a recommendation of particular units, which I declined to accept.

13. A question of organising observations in atmospheric electricity sent up by the Royal Academy of Saxony as having been referred to the Association of Academies, the Committee expressed its willingness to give the proposal its countenance if the Association of Academies wished to take it up.

14. Resolutions as to the hour of telegraphic observations, and the desirability of the investigation of the upper air, in reply to a request from MM. Larmor and Glazebrook for an expression of opinion about the use of high level observatories, and other questions under the consideration of the Treasury Committee.

15. Report of the Committee on International Telegraphy, consisting chiefly in the suggestion to promote a conference between representatives of the Committee and the International Telegraphic Conference to ascertain in what way the despatch of meteorological telegrams could be most expeditiously effected.

16. A series of questions on the mode of recording some of the observations included in the International Form A (Second Order Stations), with the object of securing greater precision (Hellmann and Rotch).

17. A series of questions as to the organisation of the Committee and its relations with its Sub-Committees. In the end the Committee preferred the latitude of its present freedom from organisation, but agreed that any proposal for the consideration of the Committee should be circulated, with a printed memorandum explaining it, one month before the meeting.

18. Following upon the above, notice was given that the Aeronautical Sub-Committee proposed to meet in St. Petersburg in August, 1904, and the proposal was approved.

19. A proposal to convene a conference of directors of Meteorological and Magnetic Observatories, and Institutes at Innsbrück in 1905, was approved.

In connexion with the meeting of the International Committee an exhibition of objects of interest in meterology, terrestrial magnetism, and allied subjects, was arranged at Southport in accordance with Minutes 624, 671, 723.

In response to the invitation conveyed in a circular issued by the Committee, apparatus or diagrams were offered for exhibition by the following :—

The Admiralty, Hydrographic Department.
The Astronomer Royal.
The National Physical Laboratory.
The Radcliffe Observatory, Oxford.
The Royal Meteorological Society.
The Scottish Meteorological Society.
The Solar Physics Observatory.
Mr. John Aitken, F.R.S.
Mr. J. Baxendell.
Mr. F. F. Blackman, M.A.
Mr. F. J. Brodie.
Dr. Buchan, F.R.S.
The Cambridge Scientific Instrument Company.
Capt. E. W. Creak, R.N., C.B., F.R.S.
M. L. Teisserenc de Bort.
Mr. W. H. Dines.
Mr. F. L. Halliwell.
Mr. F. W. Harmer, F.G.S.
Mr. J. J. Hicks.
Mr. Lander.
Dr. W. J. S. Lockyer.
Dr. H. R. Mill.
Mr. R. W. Munro.
Messrs. Newton & Co.
Prof. J. M. Pernter.
Mr. A. Lawrence Rotch.
Dr. R. H. Scott, F.R.S.
Mr. Shaw.
Prof. F. T. Trouton.
Dr. W. Mansergh Varley.
Mr. C. T. Wilson, F.R.S., and
Commander Wilson-Barker, R.N.R.

The exhibits included a large collection of diagrams illustrating meteorological and magnetic data and the results of observations in solar physics, also a number of charts and books. The apparatus included a new arrangement for the combination of a direction anemoscope with the Dines pressure tube anemograph by Mr. Baxendell, a new self-recording thermometer by Mr. Dines, and a sunshine recorder by Mr. Lander, of Canterbury, that recorded on ordinary photographic printing paper the sunshine record for each day of a month in successive lines. Callendar's recorders were also fully represented. The applications of meteorology, apart from the relation to solar physics, were illustrated by diagrams by Mr. F. W. Harmer representing the supposed average distribution of isobars in the glacial epoch, and an apparatus by Mr. F. F. Blackman, of Cambridge, showing the rapid evaporation of water from the leaves of plants.

A map of the British Isles, showing the distribution of stations in connexion with the Office, and maps of the World, showing the isobars for 21st March, 1903, 21st June, 21st September, and 21st December, 1901, were prepared in the Office to be included in the Exhibition with a number of other objects of interest in the possession of the Council.

The arrangements for the collection of the exhibits in London, and their despatch to Southport were made by Mr. Lempfert. In compliance with the suggestion of the Committee, Mr. Marriott went to Southport a week before the commencement of the meeting to receive the exhibits and superintend their arrangement.

A descriptive catalogue of the Exhibition was printed in Southport.

During the period of the meetings of the Committee daily charts with remarks and forecasts were prepared at Southport from telegraphic informatien sent from the Office. Maps 1 and 2 corresponded with those of the Daily Weather Report, but maps 3, 4, and 5 represented the distribution of sunshine, rainfall and temperature over the British Isles during the preceding day. A supply of blue stone lithographic forms was sent down to Southport for the charts and the information prepared in Southport was lithographed in black upon the blue forms by a local lithographer. Mr. Brodie was sent from the office to take charge of the preparation of the reports and forecasts. The local arrangements worked satisfactorily. The Southport edition of the report appeared each day from Thursday 10th September to Wednesday, 16th September inclusive (except Sunday). On Thursday, 10th September, a violent gale occurred and all telegrams were delayed. On the other days it was not found possible to get the report prepared before 12 o'clock or later, and the copies were ready for issue from 1.30 to 2 p.m. The correspondence between the reports at London and Southport was satisfactory. The difference in the isobars is inappreciable, except on one occasion when the two offices adopted different interpretations of a doubtful reading.

The payment of the expenses in connexion with the meeting, including personal expenses, carriage of exhibits, printing, &c., amounting to £84 10*s.* 6*d.*, as shown in Schedule M.O. 2,612, was approved.

735. *Forecasts for H.M. Yacht.*—The Secretary reported that he had received, on 25th July, a request from the Commodore of H.M. yachts for forecasts to be sent at various hours, from 8 a.m. to 7 p.m., to certain Irish ports during the week 27th July to 1st August.

As the morning forecast was required to be despatched before the regular forecasts of the Office could be prepared, special telegrams reporting observations at 7 a.m. had been asked for from 11 stations, provision had been made for attendance at the Office at 7.30 a.m., and the preparation of a map by 8 a.m.; the forecasts had accordingly been despatched as requested.

Approved.

736. *Annual Report.*—A proof of the annual report was submitted and provisionally approved. Copies were directed to be sent to all Members of the Council for the Annual General Meeting at 2.30 p.m. on Wednesday, 4th November.

737. *Antarctic Expeditions: Auxiliary Meteorological Observations.*—Read—A letter from Professor Larmor reporting the arrival at the Royal Society of a bundle of meteorological sheets from Sydney Observatory.

The Secretary was directed to prepare and circulate before next meeting a draft of a letter to the Royal Society, setting out the position of the Council with reference to the reduction of the observations made in connexion with the expeditions.

738. *International Telegraphic Service: 7 a.m. Reports* (Minutes, 646, 669, 720).—Read—The following letter, M.O. 2,497, from the Seewarte :—

M.O. 2,497. [Translation.] Hamburg, October 6th, 1903.

REFERRING to letter M.O. 76 of June 9th of the current year, the Deutsche Seewarte has the honour to renew its application for arrangements to be made as soon as possible for having observations at 7 a.m., Greenwich time, from Yarmouth and Portland Bill telegraphed to it, so that the collective telegrams of the morning observations from the British Isles may be dispensed with. Should it prove impossible, for reasons which were discussed verbally in London and Southport, to supply such early informatiom from Yarmouth, the Meteorological Office is requested to suggest some neighbouring favourably situated station, for instance Spurn Head, from which this could be done.

The Deutsche Seewarte attaches great importance to having the weather telegraphic communication from the British Isles to this country organized on the lines laid down in its letter J. No. 345 of January 17th, 1901, and which have had the approval of the Imperial post office since that date.

The Deutsche Seewarte fully recognizes the difficulties which the Meteorological Office has had to overcome, and will still have to overcome, in thus reorganising the arrangements for transmitting telegrams, and it takes this opportunity of thanking the Meteorological Office for its efforts, and further ventures to express the hope that the above-mentioned innovation may be introduced at an early date so that that state of affairs which has been desired by the Deutsche Seewarte for many years may be realized.

It should further be mentioned that the early telegraphic information from the British Isles meets a widely-felt want, and is being transmitted by the Deutsche Seewarte to other European states to an increasing extent.

(Signed) HERZ.

To the Meteorological Office,
63, Victoria Street, London, S.W.

The Secretary reported that the matter was outstanding because observations could not be obtained on suitable terms either from Yarmouth or Spurn Head. He requested authority to apply to the Admiralty for permission to arrange for the observations as a separate undertaking at one of the coastguard stations on the East coast after inquiry from the Post Office as to which of the stations would be the most suitable for the purpose, having regard to the means for transmitting the observations by telegraph or telephone.

The suggestion was approved, and authority given for an allowance not exceeding £10 per annum for the observers to be met from the sum allowed by the Seewarte for the observations.

Submitted also—The following :—

M.O. 2,594. (Translation.)

Deutsche Seewarte, Hamburg,
17th October, 1903.

THE Deutsche Seewarte begs to enclose a copy of a letter sent to the Scottish Meteorological Society, with the request that the desires of the Seewarte will be supported. It is assumed that weather telegrams from Ben Nevis in connexion with those at the base station at Fort William are of great importance to all west European countries.

A prompt settlement of this matter would be very agreeable to the Deutsche Seewarte.

(Signed) HERZ.

The Secretary,
Meteorological Office, London.

(Copy.)

Hamburg,
17th October, 1903.

THE Deutsche Seewarte is desirous of increasing the number of telegraphic reports from mountain stations in accordance with the tendency of recent times, which has been specially directed to the upper strata of the atmosphere. For this purpose it is of great importance to receive telegraphic weather reports from Ben Nevis, as this station, on account of its position, may afford useful practical information on the behaviour and progress of cyclones.

The Deutsche Seewarte, therefore, asks whether, and under what conditions, the weather telegrams can be received.

If this is practicable, the Seewarte would further be glad to receive synchronous telegrams from Fort William, at the base of Ben Nevis, which station already sends its reports to the Meteorological Office in London.

(Signed) HERZ

The Scottish Meteorological Society,
Edinburgh.

739. *Stations*—(i.) *Cambridge.*—The Secretary reported that he had learned during the month of August from Sir R. Ball that the climatological returns from the Cambridge Observatory, which had been used for the Registrar General's Reports since the Office took over their preparation, were to be discontinued at the end of the month ; that he had represented to Sir R. Ball the desirability of continuing them until the Council could take the matter into consideration, and that, in response to that representation, the observations were being continued until the end of October.

He also reported that he had consulted Professor Darwin upon the subject, and that in view of the difficulty of providing for regular observations at 9 a.m. and 9 p.m. at the Cambridge Observatory, it was desirable to ascertain whether the climatological work could not be more easily provided for at some other position in connexion with the University, and suggested Newnham College or the Botanic Garden.

Professor Darwin reported that it was proposed to instal at the Observatory self-recording instruments for the special study of questions relating to the physical aspects of meteorology.

After discussion, Professor Darwin and the Secretary undertook to report further upon the proposals.

—— (ii.) *Fishguard, Pembrokeshire.*—Reported—The receipt of specimens of automatic records of wind direction and velocity by Casella instruments, and of pressure, from Mr. G. L. Gibson, Engineer, Fishguard and Rosslare Railways and Harbours (M.O. 2,477), with the offer of a weekly return of information.

739. *Stations*—(iii.) *Malta.*—Reported—The offer of information (M.O. 2,470) from Mr. C. Leach, Director of the Meteorological Observatory of the University of Malta.

The Secretary was directed to report further on these offers, and to ascertain whether any telegraphic facilities could be obtained as regards information from Malta.

—— (iv.) *Nottingham.*—Reported—That the arrangement for a telegraphic reporting station (in place of Loughborough) at Nottingham, in charge of the Corporation, had been completed, and reports received, commencing 26th July.

—— (v.) *Climatological Stations.*—Reported—That instruments had been supplied for stations at Oundle School (F. W. Sanderson, M.A.) and Bettws-y-Coed (the District Council).

740. *Fog Inquiry.*—Reported—That Mr. Lempfert had completed the report upon the Fog Inquiry.

Referred to the Chairman.

741. *Publications: Hints to Observers in Tropical Africa.*—Reported—The receipt of copies of this publication and the issue of copies to the Foreign Office in compliance with Lord Lansdowne's request (Minute 549).

742. —— *Presentation Copies.*—Applications from the Transvaal Meteorological Department (M.O. 2,216), the Meteorological Service of Chile, Valparaiso (M.O. 2,343), and of Mr. T. G. Benn (M.O. 1,935), were granted.

743. *Instruments.*—The Secretary reported that he had taken steps to comply with a request from the Crown Agents to supply the instruments specified in an indent from the Orange River Colony upon the same terms as the supply to the Transvaal.

Approved.

744. —— *Dundee Agency.*—Submitted—Correspondence with Mr. C. H. Brown, Agent at Dundee, with reference to his fees for services rendered in connexion with the Agency, and in particular with regard to the fees payable for (i.) a partially filled log-book, and (ii.) the introduction of an observer for a distant land station.

It was decided to follow the regular practice with regard to the partially filled log-book, and to ascertain what precedents there were for payment in the case of the introduction of a land observer, and should there be not sufficient precedents to establish a practice, to allow the claim in the case in question and make the position clear for the future.

745. —— *Loan to Observer.*—The Secretary was authorised to lend a sunshine recorder to Mr. Lander, of Canterbury, for the purpose of testing the record of the instrument designed by him (see Minute 734).

746. *Instruments.*—Quarterly Return—

RETURN of SERVICEABLE INSTRUMENTS in the OFFICE and at HIS MAJESTY'S DOCKYARDS for the QUARTER ending 30th JUNE, 1903.

Place.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available 1st April, 1903	95	110	58	61	61	55
	Received, new	—	—	198	20	20	—
	„ repaired and cleaned.	13	15	—	—	—	—
	Total	108	125	256	81	81	55
	Issued	25	40	113	20	22	11
	Total available 1st July, 1903.	83	85	143	61	59	44

RETURN of ADMIRALTY INSTRUMENTS for the QUARTER ending 30th JUNE, 1903.

Depôts.	BAROMETERS.								THERMOMETERS.															
	Mercurial.				Aneroid.				Ordinary.				Maximum.				Minimum.				Screens.			
	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.	Est.	Store.	Sur-plus.	Short-age.
Portsmouth	25	24	—	1	55	49	—	6	150	143	—	7	50	53	3	—	50	58	8	—	25	18	—	7
†Devonport	25	23	—	2	55	61	6	—	150	142	—	8	50	50	—	—	50	49	—	1	22	20	—	2
Chatham	25	23	—	2	55	45	—	10	150	142	—	8	50	45	—	5	50	46	—	4	25	20	—	5
Sheerness	6	4	—	2	15	11	—	4	30	27	—	3	10	10	—	—	10	9	—	1	10	10	—	—
Queenstown	5	5	—	—	10	9	—	1	15	15	—	—	8	8	—	—	8	8	—	—	—	3	3	—
(Dockyards, Home) Total	86	79	—	7	190	175	6	21	495	469	—	26	168	166	3	5	168	170	8	6	82	71	3	14
Gibraltar	2	2	—	—	2	2	—	—	4	8	4	—	3	1	—	2	3	1	—	2	—	—	—	—
†Malta	11	8	—	3	15	9	—	6	60	42	—	18	10	9	—	1	10	9	—	1	1	2	1	—
Bombay	4	2	—	2	3	1	—	2	10	4	—	6	4	—	—	4	4	3	—	1	1	2	1	—
Halifax	3	1	—	2	4	4	—	—	20	10	—	10	4	4	—	—	4	2	—	2	1	1	—	—
†Bermuda	3	—	—	3	4	5	1	—	20	16	—	4	4	4	—	—	4	5	1	—	1	—	—	1
†Jamaica	3	2	—	1	2	5	3	—	10	10	—	—	2	—	—	2	2	1	—	1	1	1	—	—
Cape of Good Hope	7	4	—	3	8	8	—	—	33	29	—	4	8	8	—	—	8	6	—	2	2	2	—	—
Trincomali	3	2	—	1	3	1	—	2	10	14	4	—	4	5	1	—	4	4	—	—	1	1	—	—
Hong Kong	17	10	—	7	21	11	—	10	87	41	—	46	21	16	—	5	21	21	—	—	5	11	6	—
†Sydney	5	—	—	5	6	8	2	—	25	20	—	5	6	5	—	1	6	5	—	1	1	1	—	—
Esquimalt	4	4	—	—	5	12	7	—	15	27	12	—	2	3	1	—	2	4	2	—	1	2	1	—
(Dockyards, Abroad) Total	62	35	—	27	73	66	13	20	294	221	20	93	68	55	2	15	68	61	3	10	15	23	9	1
Grand Total and Net Shortages at Depôts	148	114	—	34	263	241	—	22	789	690	—	99	236	221	—	15	236	231	—	5	97	94	—	3
Meteorological Office... ...	45	83	38	—	120	85	—	35	250	143	—	107	80	61	—	19	80	59	—	21	50	44	—	6
Repairing	—	—	17	—	—	—	39	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Returnable from Depôts ...	—	—	30	—	—	—	21	—	—	—	13	—	—	—	8	—	—	—	11	—	—	—	—	—
Ordered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Net Surplus or Shortage at M.O.	—	—	85	—	—	—	25	—	—	—	—	94	—	—	—	11	—	—	—	10	—	—	—	9
Proposed to be Ordered ...	—	—	—	—	—	—	—	—	—	—	198	—	—	—	30	—	—	—	15	—	—	—	10	—

30th September, 1903. Approved.

† Supplies have been forwarded since 30th June, 1903.

NOTE.—No change has occurred in the Stocks of Hydrometers.

R. F. WALLACE.

747. *Forecasts, June* 1903 :—

The letters used have the following signification :—

a = complete success.
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	67	60	64	92
,,	b	23	34	28	
,,	c	3	3	3	
,,	d	7	3	5	
Scotland, E.	a	70	70	70	91
,,	b	14	27	21	
,,	c	13	3	8	
,,	d	3	0	1	
England, N.E.	a	40	60	50	89
,,	b	44	33	39	
,,	c	13	7	10	
,,	d	3	0	1	
England, E.	a	37	50	44	82
,,	b	40	37	38	
,,	c	17	10	14	
,,	d	6	3	4	
Midland Counties	a	47	67	57	79
,,	b	27	17	22	
,,	c	16	10	13	
,,	d	10	6	8	
England, S.	a	47	50	49	81
,,	b	27	37	32	
,,	c	23	10	16	
,,	d	3	3	3	
Scotland, W.	a	67	64	66	92
,,	b	23	30	26	
,,	c	3	3	3	
,,	d	7	3	5	
England, N.W.	a	50	57	54	87
,,	b	30	37	33	
,,	c	20	6	13	
,,	d	0	0	0	
England, S.W.	a	33	64	49	92
,,	b	54	33	43	
,,	c	13	0	7	
,,	d	0	3	1	
Ireland, N.	a	60	54	57	91
,,	b	27	40	34	
,,	c	13	3	8	
,,	d	0	3	1	
Ireland, S.	a	57	53	55	89
,,	b	30	37	34	
,,	c	7	7	7	
,,	d	6	3	4	
Summary.					
British Islands	a	52	59	56	88
,,	b	31	33	32	
,,	c	13	6	9	
,,	d	4	2	3	

July, 1903 :—

The letters used have the following signification :—
a = complete success.
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	52	71	62	89
,,	b	39	16	27	
,,	c	6	13	10	
,,	d	3	0	1	
Scotland, E.	a	52	71	62	89
,,	b	29	23	26	
,,	c	16	3	9	
,,	d	3	3	3	
England, N.E.	a	48	74	61	92
,,	b	35	26	31	
,,	c	7	0	3	
,,	d	10	0	5	
England, E.	a	58	74	66	91
,,	b	29	20	25	
,,	c	7	6	6	
,,	d	6	0	3	
Midland Counties	a	65	68	67	93
,,	b	26	26	26	
,,	c	3	3	3	
,,	d	6	3	4	
England, S.	a	74	58	66	92
,,	b	23	29	26	
,,	c	0	13	7	
,,	d	3	0	1	
Scotland, W.	a	45	71	58	87
,,	b	35	23	29	
,,	c	10	3	7	
,,	d	10	3	6	
England, N.W.	a	55	78	67	85
,,	b	23	13	18	
,,	c	16	3	9	
,,	d	6	6	6	
England, S.W.	a	39	71	55	88
,,	b	45	20	33	
,,	c	13	6	9	
,,	d	3	3	3	
Ireland, N.	a	45	81	63	84
,,	b	23	19	21	
,,	c	29	0	15	
,,	d	3	0	1	
Ireland, S.	a	35	68	52	81
,,	b	32	26	29	
,,	c	23	6	14	
,,	d	10	0	5	
Summary.					
British Islands	a	51	71	61	88
,,	b	31	22	27	
,,	c	12	5	8	
,,	d	6	2	4	

August, 1903 :—

The letters used have the following signification :

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	45	71	58	87
,,	b	32	26	29	
,,	c	16	3	10	
,,	d	7	0	3	
Scotland, E.	a	49	74	62	88
,,	b	26	26	26	
,,	c	19	0	9	
,,	d	6	0	3	
England, N.E.	a	39	61	50	86
,,	b	39	32	36	
,,	c	9	7	8	
,,	d	13	0	6	
England, E.	a	45	35	40	84
,,	b	32	55	44	
,,	c	13	10	11	
,,	d	10	0	5	
Midland Counties	a	32	48	40	74
,,	b	29	39	34	
,,	c	29	13	21	
,,	d	10	0	5	
England, S.	a	42	42	42	86
,,	b	45	42	44	
,,	c	10	16	13	
,,	d	3	0	1	
Scotland, W.	a	29	68	49	84
,,	b	39	32	35	
,,	c	26	0	13	
,,	d	6	0	3	
England, N.W.	a	42	55	49	86
,,	b	36	39	37	
,,	c	19	6	13	
,,	d	3	0	1	
England, S.W.	a	36	48	42	81
,,	b	35	42	39	
,,	c	23	10	16	
,,	d	6	0	3	
Ireland, N.	a	13	81	47	83
,,	b	52	19	36	
,,	c	32	0	16	
,,	d	3	0	1	
Ireland, S.	a	16	61	39	74
,,	b	39	32	35	
,,	c	35	7	21	
,,	d	10	0	5	
Summary.					
British Islands	a	35	59	47	83
,,	b	37	35	36	
,,	c	21	6	14	
,,	d	7	0	3	

748. *Accounts.*—Submitted—The following Statement of Accounts for the three months ending 30th June, 1903 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1902–1903	—	1,776 2 5	Administration :		
Proportion of vote ...	—	3,500 0 0	Secretary	150 0 0	
Repayment of expenses charged under—			Salaries and wages ...	270 1 6	
(1.) Incidental expenses	0 14 7		Rent, fuel, and lighting	178 15 5	
(2.) Observatories ...	10 10 5		Incidental and contingent expenses ...	94 11 8	
		11 5 0	Furniture and fittings	26 7 3	
					719 15 10
Supply of Information :			Special Researches :		
Weather Forecasts, Reports, &c. ...	202 5 7		Salaries and other charges	—	209 19 8
Telegrams sent abroad	395 3 1		Land Meteorology :		
		597 8 8	Observatories and stations, including remuneration of observers	595 15 2	
Supply of Instruments, &c. :			Salaries :— Discussion and reduction of observations, &c. ...	461 12 11	
Repayment of cost of M.O. instruments purchased by observers	31 12 6				1,057 8 1
Repayment of cost of other commissions...	—		Weather Information and Forecasts :		
		31 12 6	Telegraphic reports and storm warnings, remuneration of observers, &c.	345 14 7	
Charges for Commission :			Salaries:—Preparation and issue of reports and forecasts ...	322 1 6	
On supply of instruments, &c.	—	1 4 6			667 16 1
			Inspections :		
			Salaries and travelling expenses	—	2 9 8
Superannuation Account :			Ocean Meteorology :		
Annuity	35 3 2		Salaries :—Discussion and reduction of observations... ...	352 13 0	
Interest on Investment	13 17 6		Expenses incidental to the supply of instruments :—		
		49 0 8	Proportion for care and issue of instruments	35 0 0	
			Royal Navy ...	67 8 7	
			Mercantile Marine	128 9 1	
			Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	583 10 8
					2 16 3
			Superannuation :		
			Pensions and allowances	206 18 9	
			Invested	750 0 0	
					956 18 9
			Balance :		
			Cash at Bank	1,718 14 4	
			„ at Office ...	47 4 5	
					1,765 18 9
		£5,966 13 9			£5,966 13 9

Liabilities.	£ s. d.	Assets.	£ s. d.
To sundry creditors	929 9 4	By cash at Bank and at Office ...	1,765 18 9
„ balance	1,305 13 1	„ H.M. Exchequer	325 0 0
		„ sundry debtors	144 3 8
	£2,235 2 5		£2,235 2 5

Note.—On June 30th the amount of 2½ per cent. Annuities held by the Council for the provision of Superannuation Annuities was £1,326 7*s.* 8*d.*

749. *Logs.*—Fifty received, eight excellent—Captains O. E. Anderson, F. W. Corner, D. Alexander, Young (J. Wilson, Observer), J. J. Alsop, W. G. S. de Carteret, F. C A. Lyon, J. C. Robinson.

Also six lighthouse registers, 10 short registers.

750. *Storm Warnings:*—

Signals hoisted on 33 days ; total number of districts warned, 189.

In 76 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 62 districts by subsequent strong winds (force 6 or 7). In 51 districts they were not required.

Gales experienced without warnings.—None.

751. *Harvest Forecasts*, 1903.—Submitted—The following report :—

I have to report that in the course of the past summer, harvest forecasts were sent for varying periods of time to 74 persons, the number being precisely the same as in 1902. Of the 74 recipients—

1	received forecasts for district	2	... ...	England, N.E.
10	„ „	3	... ...	England, E.
23	„ „	4	... ...	Midland Counties.
18	„ „	5	... ...	England, S.
6	„ „	7	... ...	England, N.W.
13	„ „	8	... ...	England, S.W.
1	„ „	9	... ...	Ireland, N.
2	„ „	10	... ...	Ireland, S.

There were no applications from persons residing in any of the Scotch districts, Nos. 0, 1, or 6.

In the majority of cases the forecasts were required for a limited period only, *i.e.*, during the progress either of the hay or corn harvest.

In 16 cases, however, an application was made for them to be sent during the entire period covered by both ; while in eight cases a request for the telegrams at the time of hay harvest was followed by an application for a renewal of the service at the time of the corn harvest.

In view of the fact that agricultural work is ordinarily suspended on Sunday, and that the forecasts issued on Saturday afternoon are, in consequence, of little practical value, an offer was made this year to replace the usual 3.30 p.m. telegrams by special forecasts issued on Saturday evening, the latter giving in more general terms the probable weather for the 48 hours ending with Monday night. The number of persons availing themselves of this offer was 32, one of whom applied for the special evening forecasts, *in addition to those ordinarily issued at* 3.30 *p.m.*

Many of the recipients undertook to keep a record of the weather actually experienced during the time the forecasts were sent, forms for this purpose being supplied by the Office. Returns have been received from 31 persons, and a comparison is now being made between the forecasts issued and the subsequent weather, as noted by the various observers.

F. J. BRODIE.

752. *Accounts*—Submitted—The following statement:—

	£	s.	d.
Cash balance on 30th June	1,718	14	4
Receipts from 1st July to 20th October ...	7,686	3	3
	9,404	17	7
Cheques drawn from 1st July to 20th October	4,234	6	2
Cash balance on 20th October	£5,170	11	5

753. *Reports of Work* up to the end of September were submitted and approved.

754. *Library.*—Reported—A letter (M.O. 2,195) from the Foreign Office to the effect that the " Valdivia " report could not be obtained by way of exchange.

755. *Library.*—A list of publications received since the last meeting was laid on the table.

ANNUAL GENERAL MEETING.

756. The Thirteenth Annual General Meeting of the Meteorological Council was held at 63, Victoria Street, on Wednesday, 4th November, 1903, at the hour of 2h. 30m. p.m.

The following Members were present :—

Sir R. STRACHEY, in the Chair.

Mr. Buchan.	Mr. Dines.
Mr. Buchanan.	Mr. Scott.
Prof. Darwin.	The Hydrographer.

Mr. Shaw (Secretary).

The Secretary read the notice convening the meeting as follows :—

Meteorological Office,
63, Victoria Street, London, S.W.,
October 26th, 1903.

Sir,

I beg to inform you that the Thirteenth Ordinary General Meeting of the Meteorological Council will be held on Wednesday, the 4th proximo, at 2h. 30m. p.m., for the receipt of the Report of the Proceedings of the Council during the past year, the consideration of the Estimates for the year 1904–5, and the transaction of other ordinary business.

Draft copies of the Report of the Directors and of the Estimates proposed for the year 1904–5 will be sent in due course.

I am, &c.,
W. N. Shaw,
Secretary.

The report of the Directors was read as follows :—

The Directors report that in accordance with the articles of association :—

1. The Report of the Council for the year ended March 31st, 1903, which has been circulated to members of the Council, will be submitted shortly to the Royal Society for presentation to Parliament.

2. The estimates for the year 1903–4, as adopted at the last ordinary general meeting, have been submitted to the Treasury and approved.

3. The accounts for the year ended March 1903, after examination by two members of the Council, have been submitted to audit by the Exchequer and Audit Department.

4. That meetings of Directors have been held on the following days :—

1902	...	November	5	1903	...	February	11	1903	...	May	22
,,	...	,,	19	,,	...	,,	27	,,	...	June	5
,,	...	December	3	,,	...	March	11	,,	...	,,	19
,,	...	,,	17	,,	...	,,	25	,,	...	July	1
1903	...	January	14	,,	...	April	22	,,	...	October	21
,,	...	,,	27	,,	...	May	8				

5. That the Minutes of the proceedings have been regularly recorded and printed.

The report was adopted.

Estimates.—Submitted the following memoranda :—

MATERIALS for preparing ESTIMATES for 1904–1905.

	Estimated Expenditure 1904–1905.		Voted for 1903–1904.
Administration :	£	£	£
(1.) Council, including portion of Secretary's salary	—	850	850
(2.) Secretary, less fees as member of Council	—	625	625
(3.) Salaries :			
Chief Clerk	333		
3 Junior Clerks	445		
Office Keeper	95		
2 Messengers	117		
Caretaker	95		
	1,085		
		1,085	960
(4.) Rent, fuel, and lighting :			
Rent	635		
Fuel	50		
Lighting	35		
		720	730
(5.) Incidental and contingent expenses :			
Office Keeper's contingent account	75		
Postage	130		
Carriage of parcels, &c.	15		
Books and Printing	30		
Sundries	20		
	270		
(5*a*.) Furniture and office repairs	100		
(5*b*.) Expenses incidental to International Meteorological Congress	25		
	395		
		395	310
Special Researches and Experiments :			
(1.) Salaries :			
Secretary's Special Assistant	300		
1 Junior Clerk	150		
Female Staff (3 in number)	264		
	714		
(2.) Other charges :			
Anemometers at Holyhead	12		
Sundries	14 40		
		780	990
Land Meteorology :			
(1.) Observatories and stations :			
Aberdeen allowance	295		
Armagh „	50		
Ben Nevis „	100		
Falmouth „	250		
Fort William „ (3 quarters)	190		
Glasgow „	75		
National Physical Laboratory allowance	400		
Stonyhurst allowance	56		
Valencia	472		
Six Anemograph stations and St. Helena	84		
Meteorological Societies (Observations 2nd Order, Form A. (details) 7 stations. Form B. (results) 28 stations.	165		
	2,207		
		2,207	2,155
Carried forward	—	6,610	6,620

	Estimated Expenditure 1904–1905.		Voted for 1903–1904.
	£	£	£
Brought forward	—	6,610	6,620
(2.) Salaries: Discussion and reduction of observations:			
Observatories:			
1 Senior Clerk	295		
2 Junior Clerks	260		
2 Boy Clerks	65		
(*a.*)	620		
Stations of Second Order, Reports from Foreign Stations and Library:			
1 Senior Clerk	275		
5 Junior Clerks	775		
1 Unclassified Clerk	58	1,955	1,330
3 Messengers	117		
2 Female Clerks	110		
(*b.*)	1,335		
Weather Information and Forecasts:			
(1.) Telegraphic reports and storm warnings:			
Reports from inland stations	472		
Reports from abroad	115		
Reports sent abroad	610		
Storm warnings	331		
Hay harvest forecasts	71		
Private wires	50		
Sundry telegrams, forecasts, &c.	100		
Payments to reporters, &c. (allowances and expenses) ...	617		
Postage of reports and forecasts	245		
Weekly Reports	48		
Sundries	44		
	2,703		
		2,703	1,700
(2.) Salaries: Preparation and issue of reports and forecasts:			
2 Senior Clerks	530		
4 Junior Clerks	726		
1 Boy Clerk	54		
Addition for extra work	50		
	1,360		
		1,360	1,860
Inspections:			
Mr. Buchan, salary and travelling expenses	190		
Kew Inspectors, travelling expenses	60		
Other Inspections „	150		
Royal Meteorological Society, contribution towards cost of their inspections	25		
	425		
		400	400
Ocean Meteorology and supply of Instruments:			
(1.) Salaries: Discussion and reduction of observations:			
Marine Superintendent	400		
1 Senior Clerk	285		
5 Junior Clerks	775		
2 Boy Clerks	80		
	1,540		
Deduct proportion chargeable to care and issue of instruments	170		
	1,370		
		1,370	1,370
Carried forward		14,450	13,280

	Estimated Expenditure 1904–1905.		Voted for 1903–1904.
	£	£	£
Brought forward	—	14,450	13,280
(2.) *Care and issue of Instruments:*			
Proportion chargeable for Salaries: from (1)	—	170	180
Instruments, repairs, &c., for the Royal Navy	—	400	400
Instruments, repairs, &c., for the Mercantile Marine (average of 3 years)	210		
Agents' fees and incidental charges...	80		
	290		
		290	220
Superannuation:			
Mr. Scott	400		
Capt. H. Toynbee	144		
Payments to R. Strachan and F. Gaster	300		
„ to Reserve*	750		
	1,594		
		1,594	1,220
Totals .. .. £	—	16,904	15,300
Appropriations in aid:			
Commission and repayment of incidental expenses	40		
Grazing, sale of Observatory forms, &c.	22		
Telegraph charges repaid, forecast fees, &c.	1,118		
Cost of instruments, repaid	90		
Annuity receipts and interest on investments not appropriated	334		
		1,604	
		15,300	

* The amount of 2½ % Annuities held for the purchase of Superannuation Annuities, as occasion may arise, is £1,326.

SYNOPSIS of OFFICE SALARIES.

Service.	Proposed for 1904–1905.	Voted for 1903–1904.	1904–1905.	
			Increase.	Decrease.
	£	£	£	£
Administration (not including Council)...	1,710	1,585	125	—
Special Researches	714	964	—	250
Land Meteorology	1,955	1,330	625	—
Weather Information	1,360	1,860	—	500
Ocean Meteorology	1,540	1,550	—	10
Totals	7,279	7,289	750	760

METEOROLOGICAL OFFICE. ESTIMATES for the Year 1904–1905.

Heads of Service.	Proposed for 1904-1905.		Voted for 1903–1904.		1904–1905.	
					Increase.	Decrease.
	£	£	£	£	£	£
Administration:						
Payment of Council	850	—	850	—	—	—
Secretary (less fees as member of Council)	625	—	625	—	—	—
Salaries and wages	1,085	—	960	—	—	—
Rent, fuel, and lighting	720	—	730	—	—	—
Incidental and contingent expenses ...	395	—	310	—	—	—
		3,675		3,475	200	—
Special Researches and Experiments:						
Salaries and other charges	—	780	—	990	—	210
Land Meteorology and supply of information:						
Observatories and stations	2,207	—	2,155	—	—	—
Salaries: Discussion and reduction of observations	1,955	4,162	1,330	—	—	—
				3,485	677	—
Weather Telegraphy and Forecasts:						
Telegraphic reports and storm warnings ...	2,703	—	1,700	—	—	—
Salaries: Preparation and issue of reports and forecasts	1,360	4,063	1,860	3,560	503	—
Inspections:						
Salaries and travelling expenses	—	400	—	400	—	—
Ocean Meteorology:						
Salaries: Discussion and reduction of observations	1,370	—	1,370	—	—	—
Expenses incidental to the supply of instruments	860	2,230	800	2,170	60	—
						—
Superannuation	—	1,594	—	1,220	374	—
Totals	—	16,904		15,300	1,814	210
Deduct—Appropriations in aid:						
Commission and repayment of incidental expenses	40					
Grazing rent and sale of Observatory forms	22					
Telegraph charges repaid and forecast and information fees	1,118					
Cost of instruments repaid	90					
Annuity receipts and interest on Investments not appropriated	334					
		1,604				
Net estimated charge		15,300				

Note.—The classification of the expenditure has been revised. The total estimated amount under each head has been shown, and the appropriations in aid have been collected into a single total.

The estimates were approved, and the Secretary was instructed to forward a copy to the Treasury (P.C. 3120).

The meeting then adjourned.

63, *Victoria Street, S.W., 4th November*, 1903.

At a meeting of Directors held after the General Meeting :—

PRESENT :

SIR R. STRACHEY (IN THE CHAIR).

MR. BUCHAN.	THE HYDROGRAPHER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

757. The Minutes (733–755) of the last meeting, 21st October, were read and confirmed.

758. *Antarctic Expeditions—Auxiliary Meteorological Observations* (Minute 737). —A draft letter (P.C. 3003 R.) to the Royal Society was submitted, amended, and approved.

759. *Forecasts.*—The Secretary reported (1) an application from the Admiralty for forecasts to be sent to the Senior Officer of the Portsmouth Destroyer Flotilla ; and (2) an application from Commander Kennedy, H.M.S. " Medusa," for forecasts to be sent to him in connexion with boiler ship trials.

The Secretary was directed to ask the Admiralty for general permission to send forecasts by telegraph on service to H.M. ships.

760. *Observatories — Rainfall Observations.* — Submitted the following memorandum :—

TABULATION OF RAINFALL CURVES.

(1.) The practice at the observatories in measuring rain curves has always been to measure the trace to ·001 inch ; but since the line measured is always much wider than the equivalent of that amount, and not seldom exceeds ·005 of a scale inch, it would appear that such a minute measurement is not of much value. I, therefore, beg to suggest that in future the curves be measured to the nearest hundredth of an inch, or to ·005 inch when the amount of rainfall is too small to be entered as ·01 inch.

(2.) I further beg to suggest that from January 1st next the rainfall curves shall be measured from 30 minutes before to 30 minutes after each hour, instead of from hour to hour as at present. This will make the hourly amounts of rainfall represent a similar period to that now used for hourly values of wind velocity and of sunshine.

R. H. CURTIS.

Approved on the understanding that an amount less than ·005 is to be omitted, and ·005 or more is to be entered as ·01.

761. *Weekly Weather Report.*—Reported—that the station at Churchstoke, one of the stations from which returns are obtained for the Weekly Weather Report and Second Order Volume from the Royal Meteorological Society, had been discontinued, and that the nearest available substitute was Shrewsbury, which was not a Society's station.

The matter was adjourned pending the preparation of a map showing the distribution of Normal Climatological Stations.

762. *Publications—Presentation Copies* (M.O. 2,677).—It was agreed to offer the Monthly Summary of the Weekly Weather Report in Return for the Journal of the Department of Agriculture of Victoria.

763. *Publications—Colonial and Foreign Observations* (Minute 693).—The Secretary reported that of the tables contained in Dr. Ravenstein's abstracts those for the Soudan were in centigrade and millimetres, the others in Fahrenheit and inches, and he was directed to convert the Soudan tables in order to make the publication uniform throughout.

764. *Report on Forecasts* issued at 8.30 p.m. for September, 1903 :—

The letters used have the following signification :—
a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	43	67	55	95
"	b	47	33	40	
"	c	7	0	4	
"	d	3	0	1	
Scotland, E.	a	47	63	55	84
"	b	30	27	29	
"	c	20	7	13	
"	d	3	3	3	
England, N.E.	a	57	63	60	89
"	b	27	30	29	
"	c	13	0	6	
"	d	3	7	5	
England, E.	a	50	64	57	92
"	b	37	33	35	
"	c	13	3	8	
"	d	0	0	0	
Midland Counties	a	60	60	60	84
"	b	20	27	24	
"	c	20	10	15	
"	d	0	3	1	
England, S.	a	53	50	52	82
"	b	27	33	30	
"	c	17	17	17	
"	d	3	0	1	
Scotland, W.	a	63	70	67	92
"	b	27	23	25	
"	c	7	7	7	
"	d	3	0	1	
England, N.W.	a	37	70	54	80
"	b	33	20	26	
"	c	23	7	15	
"	d	7	3	5	
England, S.W.	a	37	57	47	79
"	b	40	23	32	
"	c	20	13	16	
"	d	3	7	5	
Ireland, N.	a	53	70	62	85
"	b	23	23	23	
"	c	17	7	12	
"	d	7	0	3	
Ireland, S.	a	37	53	45	80
"	b	33	37	35	
"	c	23	7	15	
"	d	7	3	5	
Summary.					
British Islands	a	49	63	56	86
"	b	31	28	30	
"	c	16	7	11	
"	d	4	2	3	

765. *Office Staff.*—The Secretary reported that he had appointed Henry Keeton, aged 16 years, of St. Olave's Grammar School, as boy clerk at 14*s.* per week in place of Mr. A. T. Bench promoted to a fourth-class clerkship in May last (Minute 618).

766. *Logs.*—Seven received, none excellent. One abbreviated log, one lighthouse register.

767. *Storm Warnings:*—

Signals hoisted on 6 days; the total number of districts warned, 43.

In 18 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 12 districts by subsequent strong winds (force 6 or 7). In 13 districts they were not required.

Gales experienced without Warning.—None.

FREDK. J. BRODIE.

768. *Accounts.* (1) *Rain Gauges for Forest of Dean.*—With reference to a letter of Mr. Philip Baylis, of White Mead Park, Coleford (M.O. 2,117), objecting to the charge of 5 per cent. commission upon the rain gauges supplied by the Office for use in the Forest of Dean;

The Secretary was directed to write and explain that the sum charged under the heading "commission" was intended to cover the cost to the Office of supplying the instruments.

He was also directed to revise the circular to obviate misunderstanding upon the point as far as possible.

—— (2). *Barometer Readings from Trinidad.*—The Secretary was authorised to charge to the Office Account the costs incurred in obtaining a transcript of daily readings of pressure from Trinidad, intended primarily for the use of Professor Karl Pearson. (Minute 408.)

—— (3). *Mr. Gaster's Annuity.*—The Secretary was authorised to pay Mr. Gaster's annuity in monthly instalments until the end of March, 1904.

—— (4). *Annual Audit.*—Reported—That the Office Accounts for the year ended March 31st, 1903, had been audited on 1st and 2nd October by the Exchequer and Audit Department.

—— (5). *Audit.*—Reported—That the cash accounts for the quarter ended the 30th June last had been this day examined by Prof. Darwin and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st April last, when there was a balance of £1,776 2*s.* 5*d.*, were £4,190 11*s.* 4*d.* against £4,249 10*s.* 3*d.* in the corresponding period of the preceding financial year. The payments were £4,200 15*s.* 0*d.* against £5,024 7*s.* 3*d.* during the same period in the previous year. The balance in hand and at the bank on the 30th June, 1903, amounted to £1,765 18*s.* 9*d.*, and at the same date in 1902 to £1,690 2*s.* 7*d.*

—— (6). Submitted—The following statement:—

	£	*s.*	*d.*
Cash balance on 20th October	5,170	11	5
Receipts from 21st October to 3rd November ...	23	3	0
	5,193	14	5
Cheques drawn from 21st October to 3rd November	1,047	16	10
Cash balance on 3rd November	£4,145	17	7

769. *Reports of Work* for October were submitted and approved.

770. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 18th November*, 1903.

PRESENT:

PROFESSOR DARWIN, IN THE CHAIR.

THE HYDROGRAPHER. | MR. SHAW (*Secretary*).

771. The Minutes (756-770) of the Annual General Meeting and of the last meeting of Directors, November 4th, were read and confirmed.

772. *Observations at Cambridge* (Minute 739, i.).—Submitted—The following report by Professor Darwin and Mr. Shaw :—

(i.) *Climatological Observations.*—Having regard to the facilities for regular observations at 9 a.m. and 9 p m., the most appropriate site for the thermometer screen and rain gauge at Cambridge is afforded by the Botanic Garden, where an excellent exposure might be obtained at one end of a long strip of lawn running north and south from the range of glass houses. It is not anticipated that any difficulty will arise in connection with the transfer of the work to the Botanic Garden, but as the consent of the Botanic Garden Syndicate and of the Observatory Syndicate have to be obtained for this proposed re-arrangement, and as further the Financial Board must be consulted in order that the sum hitherto paid by the Observatory may be transferred to the Botanic Garden account, some weeks must still elapse before the matter can be finally settled.

It will, however, be convenient throughout the rest of this report to assume that all the proposed arrangements can be carried out.

There is no position at the Garden immediately available for the exposure of a sunshine recorder. There is a new tower supporting a water tank which would give an excellent exposure about 35 feet high and which could be kept free of interference by trees without difficulty, but it is at present inaccessible except by means of workmen's ladders. Occasional access, is, however, desired for the purposes of the Garden and possibly a staircase might be provided, in which case the sunshine recorder could be accommodated.

Rainfall is measured by means of a rain gauge exposed in a private enclosure. The exposure complies with the office requirements though it is less satisfactory than the proposed exposure on the lawn. It would not be satisfactory for a thermometer screen as it is surrounded on three sides by warmed greenhouses or sheds at from 20 to 30 feet distance.

A possible advantage of the Botanic Garden as a site for climatological observations as compared with the Observatory is that it has much greater postal facilities, and the 9 p.m. observations could probably be sent by post for use in the Weather Report of the following day. Particulars about this matter have not been ascertained yet.

Earth temperatures are not at present taken at Cambridge.* In the opinion of the Professor of Agriculture, Mr. Middleton, observations of earth temperatures at a single place would be of comparatively little interest, as he considers that one of the most important points in this respect is the comparison of the temperature gradient in soils of various characters. He considers that three sets of observations in various soils are desirable. We are not yet aware whether the Professor of Botany concurs in this view, but if he does so it would confirm the opinion that it is not advisable to initiate such observations at one place. The considerable expense of establishing a number of such points of observation seems to render it improbable that this work can be undertaken at least at present. However, the subject is still under discussion, and Professor Middleton has promised to communicate with Professor Darwin as to the meteorological observations which seem especially desirable from the point of view of the agriculturists.

The instruments in use at the Observatory for climatological observations consist of the ordinary equipment of a telegraphic reporting station with a sunshine recorder; there is also a 5-inch rain gauge used for reporting to the British Rainfall Association. The 8-inch rain gauge and the sunshine recorder belong to the Council and would be available for use at the Botanic Gardens if the climatological station were transferred.

(ii.) *Physical Observations at the Observatory.*—The Observatory Authorities do not anticipate any difficulty in accommodating instruments for the study of atmospheric physics that do not require

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* Earth temperatures are now being recorded as follows :—

Greenwich	3 ft. 2 in.	Berkhamsted	1 ft.	Bennington	1 ft.
Kew	1 ft., 4 ft.	Oxford	various depths.	York	1 ft., 4 ft.
Camden Square	1 ft., 4 ft.	Belvoir	3 ft.	Hull	1 ft., 4 ft.
Norwood	1 ft.	Portsmouth	1 ft., 4 ft.	Manchester	1 ft., 4 ft.
Sheffield	1 ft., 4 ft.	Brighton	4 ft.	Bath	1 ft., 4 ft.
Nottingham	1 ft., 4 ft.	Parkstone	1 ft.	Llangammarch	1 ft., 4 ft.
Birmingham	1 ft., 4 ft.	Lowestoft	1 ft., 4 ft.	Guernsey	1 ft., 4 ft.
Coventry	1 ft., 4 ft.				

regular attendance twice daily throughout the year, and they are willing to take part in the establishment of such observations. The subjects which suggest themselves in this connexion are atmospheric electricity and solar radiation. Mr. Shaw has placed at the disposal of the Council for this purpose a Bendorf self-recording electrometer exhibited at Southport by Hofrath Pernter of Vienna, and Mr. C. T. R. Wilson has undertaken to supervise the erection of the instrument at the Observatory and the observations to be recorded therewith. The Observatory have in view the purchase of a Callendar electrical thermometer for recording the intensity of solar radiation, and Mr. W. E. Wilson, of Daramona, has offered the use of a bolometric receiver for this instrument, equatorially mounted, so that the instrument may be made to record the intensity of the radiation of direct sunlight free from the effects of diffuse radiation from the sky which affects the ordinary "receiver" of a Callendar Sunshine recorder. Mr. Wilson is of opinion that a clock for driving the instrument with sufficient regularity could be obtained for about £5, and has offered to defray the cost of it. With the use of this instrument there should be associated occasional observations with an Ångström's Pyrheliometer which is practically a thermopile specially arranged for measuring solar radiation and requires a sensitive galvanometer as its indicating part. This should be used to "standardize" periodically the Callendar recorder.

The addition of a Boys' radiomicrometer would complete the equipment for measurements of total solar radiation. The last might also be used in an attempt to determine the temperature of clouds by their radiation effects, a measurement of great difficulty and affected by many disturbing causes, but of great importance.

With the complete equipment many investigations in atmospheric physics might be opened. With the Callendar recorder and Ångström heliometer alone the primary result would be a record of the total solar radiation as affected by atmospheric causes. The ultimate object of the records might be described as the determination of the variation of the solar activity apart from the atmospheric disturbances, but the reference of the effects to the separate causes would be a work of some difficulty and must be a special subject of scientific investigation. If other means failed, however, cumulative evidence of the existence or non-existence of a variation in solar activity, would be afforded by a comparison of records for a series of years.

Assuming that these instruments represent the primary equipment for the work of the Observatory as regards atmospheric physics the question of auxiliary records requires consideration. The self-recording instruments at the Observatories in connexion with the Council are barographs, thermographs, pluviographs and sunshine recorders. The Council has a barograph of Mr. Dines's design, which might very well be lent. That would probably be sufficient for a beginning, as the work would be of an entirely new character, and it would be better not to overload an experimental station. Some remarks about other self-recording instruments which might give useful information are added under sections iv., v.

(iii.) *Observations at Newnham College.*—In the course of inquiry as to the best means of obtaining climatological observations, Mrs. Sidgwick, Principal of Newnham College, was asked whether the College would undertake the work. A favourable reply was received, but upon more detailed inquiry it appeared that the arrangements for regular observations at 9 p.m. would be attended with considerable, though possibly not insuperable, difficulties. In this respect, as well as in the matter of site, the Botanic Garden has the advantage, and it seems desirable for the regular climatological observations to be taken there. At the same time Mrs. Sidgwick and Miss Stephen, who has some previous experience of meteorological observations, would be glad for Newnham College to contribute observations upon an organised system, and would establish an auxiliary climatological station.

This proposal would be very acceptable, especially if it could be associated with some specific meteorological inquiry in which the observations would be utilised. Among subjects of meteorological investigation those connected with the measurement of humidity are, comparatively speaking, neglected. We know but little of the practical working of the modern forms of hair hygrometer, nor are the numerous readings of the wet and dry bulb thermometers utilised in any effective manner. Atmospheric humidity is subject to diurnal variation to a very remarkable extent, but this variation is altogether ignored if observations are restricted to 9 a.m. and 9 p.m., because the period of extreme dryness on days when the temperature range is large is at about 2 p.m. If Newnham is willing to undertake it, such a question as "Is the air of Cambridge more or less damp than that at Kew?" would be easily answered with the aid of the Kew hourly readings, and it would suggest further inquiry of a similar character. With this in view the establishment of an auxiliary climatological station, with daily readings of maximum and minimum temperatures and rainfall and special readings of the wet and dry bulbs at 9 a.m. and 2 p.m., would be very useful. Further, while special attention is being paid to observations of humidity, it would be desirable to compare the results of wet and dry bulb readings with those of a self-recording hair hygrometer, which could be subsequently utilised in the extension of the inquiry. The Council already possesses an instrument of this kind, and it might be lent, with a screen to hold it, for the purpose of comparison.

(iv.) *Automatic rain record.*—The Council has no automatic rain record from the Eastern Counties. The observations in connexion with the office at which rain is automatically recorded are Kew, Oxford, Falmouth, Stonyhurst, Aberdeen, Glasgow, Fort William, Armagh, and Valencia. Records could be borrowed from Greenwich, Berkhamsted, and Southport. A record in the east, outside the basin of the Thames, would therefore be desirable. A Halliwell recorder costs £14.

Probably any one of the three stations in Cambridge would be glad to find accommodation for a rain recorder if the Council were willing to provide one, and the record would be useful in conjunction with the operations at all three. On the whole, it would be best to offer the instrument to the Botanic Garden Syndicate with the condition that the record should be exhibited, like the Falmouth wind records, somewhere in the grounds (except when it is required for the immediate use of the Office), and that special facilities should be given to the Observatory and Newnham to consult and trace the records if they desire to do so.

(v.) *Anemograph.*—A wind record in Cambridge would suffer from the disadvantages of all inland stations—the want of a really effective exposure. There is a small Robinson anemometer at the Observatory, but it is becoming screened by trees, and undoubtedly the possibility of the much

greater elevation of a Dines' tube is a great point in favour of that instrument if the record were desired. Either the Observatory or the Botanic Garden Water Tower would accommodate an instrument.

Such an instrument would be most appropriate in connexion with the barograph and the electrograph at the observatory, and might possibly be extremely useful from that point of view. There are some special reasons for investigating the wind force at Cambridge by instruments. The estimates of wind there make it appear that winds of gale force are as frequent as on the coast. It is the custom of the Office to attribute this fact to the over estimation of strong winds by the observer; but in the experience of residents wind storms are very destructive in Cambridge, and it is quite possible that the situation is as fully exposed to strong winds as a coast station. If so it would be interesting to have the fact automatically recorded.

If a recorder is established it should indicate direction as well as velocity, and therefore if a Dines' instrument is set up it should have Mr. Baxendell's arrangement for recording the direction.

It is worthy of note, however, that the Office is not making any special use of the bridled anemometer at Holyhead. It is perhaps unnecessary to keep both that and the Dines' tube installed there any longer. The bridled anemometer was designed by Stokes, and the Cambridge Observatory might be interested in having it set up there. It only records very strong winds at present. It could be supplemented by a Baxendell direction recorder.

(vi.) *The Custody of Records.*—Some question is likely to arise about the custody of the records. In view of the desirability in nearly all inquiries of comparing meteorological records from different stations, it is desirable that the records should ultimately be deposited in one office. In the case of records coming from a recognised Observatory such as that of Cambridge, there should be a reciprocal understanding that the meteorological records are kept, as a rule, in London; but the originals would be sent down with others for comparison if required for any scientific inquiry, to be used at the Observatory and returned within a limited time.

We accordingly recommend that the Council approve of the following suggestions:—

(i.) That assuming that the proposed arrangement can be carried out, and provided that satisfactory arrangements are made for the transmission of the observations to the Office the meteorological instruments now at the Cambridge Observatory belonging to the Council be transferred from the Observatory to the Botanic Garden.

(ii.) That the Dines' self-recording barometer be lent to the Observatory under the circumstances indicated in the foregoing report.

(iii.) That the Bendorf electrograph, placed at their disposal for the purpose by Mr. Shaw, be lent to the Observatory, provided that Mr. C. T. R. Wilson is willing to supervise its erection and its results.

(iv.) That if an auxiliary climatological station be established at Newnham College a Richard's hair hygrograph and a screen for exposing it be lent to Newnham College, to enable them to carry out a special investigation with regard to the humidity of the air.

(v.) That a Halliwell rain recorder be lent to the Botanic Garden Syndicate if they are willing to make arrangements for the care of it, to exhibit the records in the grounds, to give facilities for the Observatory and Newnham College to consult them, and forward them to the Office from time to time.

(vi.) That the bridled anemometer be transferred from Holyhead to Cambridge if the Observatory be willing to instal it, and that [the Observatory be asked to provide] a Baxendell anemoscope for the purpose of recording the direction of the wind.

(vii.) That the records of meteorological instruments established at Cambridge with the co-operation of the Council be ultimately deposited in the Office upon the understanding that they will be sent at the request of the Observatory or of the Botanic Garden Syndicate or of Newnham College, with others for comparison if required, at any time for the purpose of scientific inquiry.

G. H. D.
W. N. S.

Resolved—That the report be printed in the minutes, and that Professor Darwin be requested to consult the several authorities at Cambridge respecting the proposals.

773. *Board of Agriculture and Technical Instruction for Ireland: Kite Observations.*—The Secretary reported correspondence (M.O. 2,728) and interviews with Mr. E. W. L. Holt, Scientific Adviser to the Irish Board of Agriculture, who had recently been in London, respecting a proposal to initiate Kite observations upon a steamer belonging to the Board and employed in connexion with the fisheries.

With reference to a suggestion by Mr. Holt, that the apparatus at present in use by Mr. Dines might be lent in order to see whether the work could be undertaken satisfactorily before incurring the expense of an outfit, the Secretary was directed to make any necessary inquiries and to ascertain what cost would be involved in complying with a request from the Board for Mr. Dines to give instruction in the use of the apparatus.

774. *Forecasts* for October, 1903 :—

The letters used have the following signification :
a = complete success.
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	34	67	51	92
,,	b	50	33	41	
,,	c	13	0	7	
,,	d	3	0	1	
Scotland, E.	a	30	70	50	84
,,	b	40	27	34	
,,	c	23	3	13	
,,	d	7	0	3	
England, N.E.	a	40	60	50	90
,,	b	47	33	40	
,,	c	10	7	9	
,,	d	3	0	1	
England, E.	a	27	67	47	86
,,	b	47	30	39	
,,	c	23	3	13	
,,	d	3	0	1	
Midland Counties	a	7	50	29	72
,,	b	43	43	43	
,,	c	40	7	23	
,,	d	10	0	5	
England, S.	a	44	57	51	94
,,	b	43	43	43	
,,	c	10	0	5	
,,	d	3	0	1	
Scotland, W.	a	43	70	57	80
,,	b	17	30	23	
,,	c	27	0	14	
,,	d	13	0	6	
England, N.W.	a	30	57	44	79
,,	b	30	40	35	
,,	c	37	3	20	
,,	d	3	0	1	
England, S.W.	a	37	73	55	80
,,	b	33	17	25	
,,	c	20	7	14	
,,	d	10	3	6	
Ireland, N.	a	30	67	49	80
,,	b	40	23	31	
,,	c	23	10	17	
,,	d	7	0	3	
Ireland, S.	a	27	63	45	77
,,	b	33	30	32	
,,	c	27	7	17	
,,	d	13	0	6	
Summary					
British Islands	a	32	64	48	83
,,	b	38	32	35	
,,	c	23	4	14	
,,	d	7	0	3	

775. *Harvest Forecasts*, 1903.—Submitted the following report:—

I beg to submit herewith the result of a comparison between the harvest forecasts issued in 1903 and the weather subsequently experienced, the latter information being derived solely from returns supplied by a number of the recipients. In three instances no actual weather record was kept, but the opinion of the recipient as to the success of the forecasts was entered on each of the daily telegrams. In the accompanying table the results shown by these cases have been incorporated with others in which more definite information was supplied.

RESULT OF CHECKING OF HAY HARVEST FORECASTS, 1903.

From information supplied by Recipients.

Districts and Names.	Number checked.	A = Complete success.		B = Partial success.		C = Partial failure.		D = Total failure.	
		No.	%	No.	%	No.	%	No.	%
ENGLAND, N.E.:									
Grange Hill, Durham* ...	66	45	70	12	18	6	9	2	3
ENGLAND, E.:									
Weston	74	43	58	30	41	—	—	1	1
Morden Hall	8	4	50	4	50	—	—	—	—
Brettenham Park	28	14	50	12	43	1	4	1	3
Tolleshunt D'Arcy ...	70	37	53	25	36	5	7	3	4
For District	180	98	55	71	39	6	3	5	3
MIDLAND COUNTIES:									
Ketton	7	3	43	4	57	—	—	—	—
Northfield	122	47	39	37	30	26	21	12	10
Kirkby Malham	21	4	19	9	43	6	29	2	9
Berriew	35	12	34	17	49	3	9	3	8
Wombourne	14	5	36	7	50	2	14	—	—
For District	199	71	36	74	37	37	19	17	8
ENGLAND, S.:									
Englefield Green	5	3	60	2	40	—	—	—	—
Sturminster Marshall ...	14	7	50	6	43	1	7	—	—
Staplehurst†	63	58	92	4	6	—	—	1	2
Monks Horton Park ...	112	44	39	43	38	21	19	4	4
Henstridge	122	54	44	34	28	27	22	7	6
Minster, Sheppey	21	9	43	9	43	2	9	1	5
Rayham Farm, Sheppey ...	21	11	52	7	34	—	—	3	14
Shipley Place	38	18	47	9	24	8	21	3	8
Denham	21	13	62	4	19	4	19	—	—
For District	417	217	52	118	28	63	15	19	5
ENGLAND, N.W.:									
Llandudno	116	46	40	36	31	30	26	4	3
Wern...	120	59	49	34	29	23	19	4	3
For District	236	105	45	70	30	53	22	8	3
ENGLAND, S W.:									
Bishop's Lydeard	108	42	39	44	41	21	19	1	1
Overcourt	28	12	43	13	46	3	11	—	—
Newport, Mon.	6	1	17	4	67	1	16	—	—
Llanwern	2	—	—	2	100	—	—	—	—
Brynog	14	6	43	5	36	3	21	—	—
Noyaddtrefawr	28	13	46	9	32	6	22	—	—
Broadclyst	14	6	43	6	43	2	14	—	—
For District	200	80	40	83	41	36	18	1	1
IRELAND, N.:									
Balatalion Abbey	29	20	69	9	31	—	—	—	—
IRELAND, S.:									
Fassaroe	11	6	55	5	45	—	—	—	—
Leap Castle‡	12	6	50	4	33	1	9	1	8
For District	23	12	52	9	39	1	5	1	4
Total	1,350	649	48	446	33	202	15	53	4

* Majority checked by recipient. † Checked by recipient. ‡ Half checked by recipient.

The comparison shows that for the country as a whole 48 per cent. of the forecasts were completely successful and 33 per cent. partially successful, 15 per cent. being partial failures and 4 per cent. total failures.

Omitting the results derived from the record of one observer in Ireland, N., whose return, showed a percentage of 69 completely successful and 31 partially successful forecasts, the highest percentage of success was attained in England, E., where 55 per cent. of the forecasts were completely successful and 39 per cent. partially so. Next to this the highest proportion was reached in Ireland, S., where the percentages of complete and partial success were respectively 52 and 39.

The smallest degree of success was attained in the Midland counties, the percentage values being in this case respectively only 36 and 37.

The following remarks as to the value of the forecasts have been communicated to the Office ;—

By Mr. W. Burkitt, Grange Hill, Bishop Auckland (letter M.O. 2,222) :—"I am pleased to say that the forecasts have been wonderfully correct this year, or rather, I should say, I am *sorry* to say, as the bad weather predicted, and which we have had, is very disappointing to us agriculturists."

By Mr. Jesse Norris, Staplehurst, who, in a note asking for a further supply of the forecasts, remarked :—"I am quite satisfied with what I have received ; it is a great help in my business."

One of the recipients at the Aynsome Agricultural Station, Grange-over-Sands, reported that the forecasts were less successful than those of the previous year. The same result is shown by the figures in the table, and is doubtless attributable to the extremely unsettled character of the weather of last summer, and to the complexity of the changes with which the forecaster had so often to deal.

FREDK. J. BRODIE.

776. *Storm Signal Stations : Noman's Fort.*—It was resolved to comply with a request from Lloyds (M.O. 2,785) for the establishment of Lloyd's signal station at Noman's Fort in the Solent as a storm signal station upon the usual terms, provided that the War Office authorities are willing to sanction the display of the signal and the use of the telegraph line for the transmission of the messages.

777. *Colonial Observations : St. Helena Anemograph.*—Read—A memorandum from Mr. R. H. Curtis to the effect that the records for the six months ended June 30th were unsatisfactory, especially the direction sheets, and suggesting that, as about 15 years of records had been collected from St. Helena, it was desirable to remove the instrument.

The Secretary reported that he had asked Mr. Curtis to prepare a report on the results obtained from the anemometer.

Approved.

778. *Colonial Observations.*—The Secretary reported that meteorological returns were received from the various colonies in very diverse forms, and he was requested to draw up a proposal for obtaining uniformity as far as might be practicable.

779. *Publications : Occasional reports.*—The Secretary was authorised to edit for issue as occasional reports in the form of supplements to the quarto publications (1) notes upon the working of solar maximum and grass minimum thermometers, and upon the electrometer records by Dr. Chree (M.O. 2760) ; and (2) the discussion of the St. Helena wind records by Mr. Curtis.

780. *Logs.*—Eight received ; three excellent—Captains J. W. Millican, A. Simpson, H. Eagleton.

781. *Storm Warnings :—*

The signals hoisted on two days, total number of districts warned 17.

Warnings justified in seven districts by subsequent gales (force 8 and upwards) in three districts by subsequent strong winds (force 7 or 6). In seven districts they were not required.

Gales experienced without Warnings.—None.

782. *Typewriter.*—The Secretary was directed to apply to the Stationery Office for a Bar Lock Typewriter to replace the typewriter lent by Miss Clowes.

783. *Accounts.*—Submitted—The following statement:—

	£	s.	d.
Cash balance on 3rd November	4,145	17	7
Receipts from 4th to 17th November	45	0	0
	4,190	17	7
Cheques drawn from 4th to 17th November ...	504	14	11
Cash balance on 17th November	£3,686	2	8

784. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 2nd December*, 1903.

PRESENT:

SIR R. STRACHEY (IN THE CHAIR).

MR. BUCHAN. | PROFESSOR DARWIN.

MR. SHAW (*Secretary*).

785. The Minutes (771–784) of the last meeting (18th November) were read and approved. It was ordered that a copy of Minute 775 (Harvest Forecasts, 1903), be sent to Sir T. H. Elliott, Secretary of the Board of Agriculture.

786. *Annual Report* (Minute 736).—Authority was given for the signature of the revised copy as soon as it is received from the printers. (P.C.3393).

787. *Observations at Cambridge* (Minute 772).—The recommendations appended to the report in Minute 772 were approved. The Secretary was directed to express the thanks of the Council to Mr. W. E. Wilson for his offer. Professor Darwin was requested to report further in case authority was required for incidental expenditure in connexion with the installation of the instruments.

The Secretary reported that Mr. Dines had offered to lend the pressure plate anemometer, designed by himself and exhibited by Mr. Munro at the Southport Exhibition (Catalogue, A. 45), for comparison with other instruments, at one of the anemometer stations of the Council affording a satisfactory exposure for the purpose.

Authority was given to erect the instrument at Holyhead in place of the bridled anemometer in case that instrument is removed to Cambridge.

788. *Daily Weather Report.*—Read—M.O. 2,909 from F. J. H. Coutts, M.D., stating that the Corporation of Blackpool were intending to instal the following instruments: A Dines' recording anemometer, a Campbell-Stokes sunshine recorder (removed from its old position), Stevenson screen, with the usual instruments, a four feet (earth) thermometer, solar radiation thermometer, and a grass thermometer; also five inch rain gauge and Negretti and Zambra recording rain gauge; and asking for daily readings to be recorded on p. 4 of the Daily Weather Report.

Approved on the usual conditions.

The Secretary was directed to note the existence of the self-recording instruments in the list of stations in connexion with the Office.

789. *International Telegraphic Service, 7 a.m. Reports* (Minute 758).—Read—M.O. 2,847 from the Post Office indicating Lowestoft as the port with the best facilities for transmitting 7 a.m. observations on the coasts of Norfolk, Suffolk, and Essex; also M.O. 2,904 from Mr. S. Coltmore Jones, of the Estate Offices, Skegness, urging the Council to decide in favour of Skegness as the East Coast station for the Hamburg telegrams.

The Secretary was directed to inquire further, and to make arrangements for the reports to be sent from Skegness if the required facilities could be obtained.

790. *Cloud Observations* (Minute 660).—The Secretary was authorised to supply Fineman nephoscopes to Aberdeen (M.O. 2,919) and Valencia, for cloud observations in connexion with the international balloon ascents, in compliance with the further request of Professor Hergesell (M.O. 2,814).

791. *Instruments.*—The Secretary was authorised to lend a barograph to Mr. T. G. Benn, formerly of Newton Reigny and now of Rossall Beach, Fleetwood, so long as there is one available for the purpose (M.O. 2,665).

792. *Publications* (i.).—A re issue of "Instructions for keeping a meteorological log" was authorised.

(ii.) The requisition of additional official copies of O. 43, 123*, 142 from the Stationery Office, and of O. 124, 132 from the Admiralty, was authorised.

(iii.) Reported—That the reproductions of O. 59 (Minute 113) were now completed and ready for press.

Authority was given for their issue with a prefatory note, stating that the charts had been reproduced on a smaller scale than the original issue.

793. *Publications: Presentation Copies.*—Agreed to present copies of the publications dealing with Harmonic Analysis to Mr. J. R. Sutton, of Kimberley, South Africa, and to communicate with him about other publications (M.O. 2,066).

794. *Inquiries* (i.).—Read—M.O. 2,891 from Mr. J. J. H. Teall, Director of the Geological Survey, asking for information as to the preparation of rainfall maps of Lincolnshire and other counties.

It was agreed that, as the Council would have to consult the British Rainfall Organisation upon the preparation of county rainfall maps, they were of opinion that application should be made direct to Dr. Mill by the Geological Survey. (P.C. 3,315.)

(ii.) Read—M.O. 2,835 from Captain Wilson Barker, President of the Royal Meteorological Society, asking for information about the scarcity of observations in different parts of the Ocean.

The Secretary was directed to supply the information asked for, and to lend copies of certain charts asked for by Captain Wilson Barker.

795. *Logs.*—Eight received, none excellent; two abbreviated registers.

796. *Storm Warnings:*—

Warnings Issued.—Signals hoisted on five days; total number of districts warned, 43.

In 20 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 11 districts by subsequent strong winds (force 7 or 6). In 12 districts they were not required.

Gales experienced without warning.—A fresh to strong gale from W. and N.W. occurred on our extreme North and North-West coasts between Nov. 20 and 21, and was due to a small secondary depression which appeared off the North of Scotland in the rear of a larger disturbance over Scandinavia. At 6 p.m. on the 20th there were not sufficient indications of such a change. The secondary appears to have advanced rather suddenly from the N.

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* 3rd December, 1903. The Stationery Office has now requisitioned 13 of the remaining Office copies for sale, and only two copies of this publication now remain.

797. *Accounts.*—Submitted—The following Statement of Accounts for the six months ending 30th September, 1903 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1902–1903	—	1,776 2 5	Administration :		
Proportion of vote ...	—	7,000 0 0	Secretary	300 0 0	
Repayment of expenses charged under—			Salaries and wages ...	540 14 6	
(1.) Incidental expenses	2 15 10		Rent, fuel, and lighting	354 5 10	
(2.) Observatories ...	14 1 4		Incidental and contingent expenses ...	158 8 10	
		16 17 2	Furniture and fittings	29 16 3	
Supply of Information :			Expenses incidental to International Meteorological Congress ...	5 12 2	
Weather Forecasts, Reports, &c. ...	328 10 7		Special Researches :		1,388 17 7
Telegrams sent abroad	451 16 4		Salaries and other charges	—	417 8 10
		780 6 11	Land Meteorology :		
Supply of Instruments, &c. :			Observatories and stations, including remuneration of observers	1,112 13 7	
Repayment of cost of M.O. instruments purchased by observers	57 0 8		Salaries :— Discussion and reduction of observations, &c. ...	909 14 2	
Repayment of cost of other commissions...	214 7 6		Weather Information and Forecasts :		2,022 7 9
		271 8 2	Telegraphic reports and storm warnings, remuneration of observers, &c.	1,088 19 10	
Charges for Commission :			Salaries:—Preparation and issue of reports and forecasts ...	697 11 7	
On supply of instruments, &c.	—	9 10 11	Inspections :		1,786 11 5
			Salaries and travelling expenses	—	2 9 8
Superannuation Account :			Ocean Meteorology :		
Annuity	106 14 6		Salaries : —Discussion and reduction of observations... ...	695 17 0	
Interest on Investment	16 17 10		Expenses incidental to the supply of instruments :—		
		123 12 4	Proportion for care and issue of instruments	70 0 0	
			Royal Navy ...	179 17 2	
			Mercantile Marine and stations ...	209 2 1	
			Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	1,154 16 3
					80 3 7
			Superannuation :		
			Pensions and allowances	414 10 1	
			Invested	750 0 0	
					1,164 10 1
			Balance :		
			Cash at Bank	1,843 13 1	
			„ at Office ...	50 19 8	
			Advances for Travelling Expenses ...	66 0 0	
					1,960 12 9
		£9,977 17 11			£9,977 17 11

Liabilities.	£ s. d.	Assets.	£ s. d.
To sundry creditors	1,280 14 7	By cash at Bank and at Office ...	1,894 12 9
„ balance	1,394 11 2	„ H.M. Exchequer	650 0 0
		„ sundry debtors	130 13 0
	£2,675 5 9		£2,675 5 9

Note.—On September 30th the amount of 2½ per cent. Annuities held by the Council for the provision of Superannuation Annuities was £1,326 7*s.* 8*d.*

798. *Accounts*—Submitted—The following statement :—

	£	s.	d.
Cash balance on 17th November	3,686	2	8
Receipts from 18th November to 1st December	39	17	8
	3,726	0	4
Cheques drawn from 18th Nov. to 1st Dec. ...	787	16	1
Cash balance on 1st December	£2,938	4	3

799. *Board of Agriculture: Printing of Maps.*—Reported—the receipt of a circular from the Board of Agriculture giving particulars of the methods available for obtaining reproductions of maps, &c., from the Ordnance Survey Office.

800. *Reports of Work* for November were submitted and approved.

801. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 16th December*, 1903.

PRESENT :

SIR R. STRACHEY (IN THE CHAIR).

PROFESSOR DARWIN. | MR. SHAW (*Secretary*).

802. The Minutes (785-801) of the last meeting (2nd December) were read and confirmed.

803. *Observations at Cambridge* (Minutes 772, 787).—Reported—that with the exception of the Dines barograph and certain parts of the recording raingauge all the apparatus required from the Office for establishing the observations contemplated in Minute 772 had been sent to Cambridge, that Mr. J. A. Curtis had visited the Botanic Garden on 11th December to arrange with Mr. Lynch, the Curator, for the exposure of the instruments there, and that it was necessary that he should go again to complete the installation of the recording raingauge.

Approved.

804. *Cloud Observations* (Minute 790).—(i.) Reported—that the Astronomer Royal had expressed his willingness to co-operate in nephoscopic observations (M.O. 2,892) and desired the Council to obtain a nephoscope for him.

—— (ii.) Read—M.O. 3041 from Mr. Glazebrook enclosing a request from the Royal Horse Show, Richmond, to obtain the removal of the pedestal and railings erected in connexion with the cloud observations of 1884 (Minutes, 1884–5, p. 34).

The Secretary was directed to reply that the Council were of opinion that the pedestal and railing should be retained for the present.

805. *Publications.*—(i.) (O. 123.) The question of the republication of O. 123 (Minute 792, ii.) was postponed.

—— (ii.) *Pilot Charts for the Indian Ocean* (Minute 537).—Submitted—a preliminary specimen showing the proposed arrangement of the front of the charts with some of the data.

The Secretary was directed to confer with the Meteorological Reporter to the Government of India upon the matter, sending to him a memorandum explaining the proposal.

806. *Publications—Presentation Copies.*—(i.) In reply to a request for an exchange of publications from the Department of the Interior, Ottawa, in M.O. 3,001, covering maps of Assiniboia, Saskatchewan, &c., the Secretary was directed to ascertain what publications the Department desired.

—— (ii.) It was resolved to send a copy of the Monthly Report to the Servicio Meteorologico Nacional of Monte Video in exchange for the Boletin Pluviometrico of that Office.

807. *Colonial Observations—Ocean Island.*—Read M.O. 3,009 from Percy F. Money, Surgeon to the Pacific Islands Company, 120, Fenchurch Street, E.C., offering to take observations for the Office at Ocean Island, Long. 169° 35′ E., Lat. 0° 52′ S.

The Secretary was directed to make enquiries from the Company about the proposal.

808. *Marine Observations—Foreign Steamship Companies.*—Submitted the following memorandum :—

Permission of the Council is requested to seek the co-operation of the undermentioned Foreign Steamship Companies. These Companies own vessels which traverse parts of the North Atlantic, where observations are much needed to supplement those used in the compilation of our Daily Synoptic Weather Maps, and of our inset on the Monthly Pilot Chart showing the mean sea surface temperature for that area.

Compagnie Générale Transatlantique.—To West Indies, Colon, &c., from Bordeaux.

Hamburg American Line.—To West Indies, Mexico, Colon, Brazil, &c., from English Channel; and to River Plate from Mediterranean; and New York from Mediterranean.

Norddeutscher Lloyd.—To River Plate, from English Channel.

Kosmos, Deutsche Dampschiff-fahrt Gesellschaft.—To South America and Central America from English Channel.

Hansa Line (Germany).—To River Plate.

Compañia Transatlantica of Barcelona.—To West Indies, New York, and Vera-Cruz from Cadiz and from Santander.

Italian Mail Steamers.—To Buenos Ayres from Mediterranean, and to New York from Mediterranean.

Campagnia La Veloce.—To Brazil from Mediterranean.

809. *Geographical Association Exhibition.*—Read—M.O. 3,039 from A. J. Herbertson, Secretary of the Geographical Association, asking for an exhibit of maps, &c., at a Geographical Exhibition to be held in January and February in London, and later on in the chief towns of Britain.

The Secretary was authorised to lend maps or other publications for exhibition after consultation with Mr. Herbertson.

810. *Instruments—Callendar Recorder* (Minute 170, 1901-2).—The Secretary reported that difficulty was experienced in obtaining cells charged satisfactorily to work the recorder, and submitted a memorandum (M.O. 3,038) giving the cost of various arrangements for obtaining the requisite battery power.

The further consideration of the subject was postponed.

811. *Logs.*—Ten received; one excellent, Capt. J. J. Bailey.

812. *Storm Warnings:*—

Warnings Issued.—Signals hoisted on eight days; total number of districts warned, 52.

In 25 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 15 districts by subsequent strong winds (force 7 or 6). In 12 districts they were not required.

Gales experienced without warning.—None.

813. *Forecasts.*—Submitted—the following report for November, 1903 :—

The letters used have the following signification :—

a = complete success.
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	33	84	59	87
"	b	43	13	28	
"	c	17	0	8	
"	d	7	3	5	
Scotland, E.	a	30	73	52	78
"	b	33	20	26	
"	c	24	7	16	
"	d	13	0	6	
England, N.E.	a	50	70	60	82
"	b	23	20	22	
"	c	17	7	12	
"	d	10	3	6	
England, E.	a	44	77	61	86
"	b	33	17	25	
"	c	10	6	8	
"	d	13	0	6	
Midland Counties	a	47	77	62	86
"	b	30	17	24	
"	c	7	3	5	
"	d	16	3	9	
England, S.	a	60	60	60	87
"	b	17	37	27	
"	c	17	3	10	
"	d	6	0	3	
Scotland, W.	a	30	83	57	87
"	b	44	17	30	
"	c	23	0	12	
"	d	3	0	1	
England, N.W.	a	40	74	57	86
"	b	37	23	29	
"	c	17	3	10	
"	d	6	3	4	
England, S.W.	a	44	80	62	87
"	b	33	17	25	
"	c	13	0	7	
"	d	10	3	6	
Ireland, N.	a	17	90	54	85
"	b	53	10	31	
"	c	30	0	15	
"	d	0	0	0	
Ireland, S.	a	50	67	59	86
"	b	24	30	27	
"	c	13	0	6	
"	d	13	3	8	
Summary.					
British Islands	a	40	76	58	85
"	b	34	20	27	
"	c	17	3	10	
"	d	9	1	5	

814. *Telegraphic Stations.*—Submitted the following memorandum :—

TELEGRAPHIC REPORTING STATIONS.

MATTERS MENTIONED BY INSPECTORS REQUIRING EARLY ATTENTION.

Malin Head.—? New minimum thermometer. Present one 0·8° too high, but error not confirmed by previous inspections.

Parsonstown.—Barometer 0·018 in. too low. Error apparently increasing.

North Shields.—Thermometer screen requires repairing and repainting. ? New minimum thermometer. Present one nearly 0·7 too low ; confirmed by previous inspections.

Spurn Head.—New screen required ; present one worn out. Also new spare thermometer ; there is no spare one at this station.

Yarmouth.—New dry bulb and minimum thermometers. Dry bulb 1° too high ; confirmed by last inspection. Minimum thermometer 1° too low. A new minimum was supplied last year ; the error at that time cannot be ascertained, but Mr. Wallace believes it was small.

Holyhead.—There is no deputy observer here, a very serious state of things at so important a station.

Pembroke.—New dry bulb and spare thermometers. The figures on the porcelain scale of dry bulb are very indistinct and in some places almost illegible. There is no spare thermometer here.

Scilly.—The maximum and minimum thermometers are not graduated on the stems ; this is very undesirable.

The Secretary was authorised to replace the defective instruments and have the necessary repairs carried out.

815. *Inspections.*—Submitted the following report :—

The Inspectors for 1903 were as follows :—

Observatories and Anemograph Stations ...	Mr. T. W. Baker and Mr. E. G. Constable, by arrangement with the Director of the National Physical Laboratory.
Districts 0, 1 and part of 6	... Dr. A. Buchan.
„ 2 and part of 4	... Mr. J. A. Curtis.
„ 3	... Mr. R. G. K. Lempfert and Mr. W. Marriott.
„ 5	... Mr. H. Harries and Mr. W. Marriott.
„ 7 and part of 6	... Mr. R. H. Curtis.
„ 8 „ „ 4	... Mr. F. J. Brodie.
„ 9 and 10 and part of 8 ...	... Capt. C. Hepworth.

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* New Station since 31 March, 1902. † Station discontinued.
‡ Information received weekly for use in the Weekly Weather Reports.
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$ „ „ "$" „ „ „ Scottish „ „

GENERAL REMARKS BY DR. BUCHAN.

REPORT OF INSPECTION OF SCOTTISH STATIONS FOR THE YEAR 1903.

Barometers.

The barometers at the stations were compared with inspector's standard No. 690, which continued to be in good order during the inspection, as shown by a comparison with the Standard barometer in Edinburgh at the beginning and at the end of the inspections. The Standard No. 690 had been recently repaired and compared at Kew, and provided with a new box with india-rubber fittings adapted for greater safety in carriage. This arrangement has proved to be an eminently successful one. The barometer at Lairg, which was known to be out of order before inspection, was examined and put right.

Thermometers.

These instruments were, as usual, read twice, first by the observer as they hung in the screen, and then by the inspector after they had been in water. The thermometers were found to be in good order. The inspector's new thermometer No. 6,297, which is virtually free from instrumental error throughout the scale, proved to be a convenient and satisfactory instrument.

Hygrometers.

In all cases the dry and wet bulb thermometers were read as they hung in the screen, and immediately on its being opened, with the gratifying result that these thermometers are well attended to. In many cases new dry and wet bulb thermometers had been sent to the stations in the beginning of last winter, the uncorrected readings of which closely agreed together.

ALEXANDER BUCHAN.

GROUP A.—OBSERVATORIES.

Aberdeen, August 29th and September 1st.—The assistant here now, under Professor Niven, is Mr. G. A. Clarke, who seems to take much interest in the work and should prove a good observer.

The self-recording meteorological instruments were dismounted and cleaned.

It was found that the pointer attached to the free ends of the zinc rods for the temperature adjustment of the barograph was loose, and the knife-edge dirty; and the temperature-bar must have been out of action for some time past. The knife-edge and bearings were cleaned and re-polished, the glass pointer cemented in its bed, and all left in good working order again. To correct the change in the residuals due to the repair, &c., the mercury was raised an amount equivalent to a measurement of 0·06 inch on the curves, and the residuals now average about—0·005 inch.

The oil in the direction roller-bearings of the anemograph was in a satisfactory condition.

There is considerable back-lash with the direction fan-spindle, and the endless worm on the spindle is much worn.

The Beckley rain-gauge was working satisfactorily.

There was nothing calling for special remark in the thermograph; the usual cleaning, &c., was done.

E. G. C.

Armagh, September 18th–19th.—Everything at this station was in good order.

The weather being fine, I was enabled to entirely dismount the anemometer. The instrument was found to be in good order. I cleaned the various parts, and supplied the different bearings with fresh sperm oil. The clock and recording apparatus were also examined and oiled, and the orientation, when tested, was found correct. One of the clamping screws on the direction shaft was broken; this I got repaired.

The rain-gauge clock was cleaned and a new line attached to the weight, whilst the mercury upon which the float rests was filtered and rubbings of both funnels were obtained.

Since the last inspection a good many of the trees surrounding the sunshine recorder have been topped, and the work is still being continued.

As regards earth temperatures, Dr. Dreyer informed me that there are no thermometers at the observatory suitable for this purpose, but that he would be willing to take daily observations if the Council supplied the necessary instruments.

A suitable site could be obtained on the grass plot near to the Stevenson screen. The sub-soil is a uniform and very compact clay and extends to a considerable depth. It is quite dry as far as 6 feet down, as shown by the space around the pillar which supports the equatorial instrument, and which is about 20 feet distant.

T. W. B.

Ben Nevis, August 18th.—As happened in 1901, this station was inspected by Mr. A. Watt, Chief Assistant, Scott. Met. Society, on the lines settled by me before he made the ascent. On his return the schedule was filled up jointly from observations below and Mr. Watt's observations and inspection on the summit.

The work is well understood by all the observers and is carefully and accurately done.

Mr. Watt reports that the extensive repairs and renovations which were recently ordered by the Directors are well in hand, and when completed will add greatly to the comfort of the observers.

In spite of the inevitable inconvenience and confusion that at present exists, the clerical work is up to date, and the ordinary work of the observatory proceeding with the greatest smoothness.

A. B.

Falmouth, September 9th–16th.—Here the instruments were all in good order and the photography was up to the usual standard of excellence of this observatory.

Both the barograph and thermograph clocks were taken to pieces and cleaned and the lenses and fittings duly attended to. The thermograph clock needed a new cord, and the position of the zero dots was changed from summer to winter.

On di-mounting the anemometer, the oil in the direction-well, though discoloured, was found quite limpid ; I had all parts cleaned and the bearings were replenished with fresh sperm oil.

The clock and recording parts were also examined, and the orientation tested.

The self-recording rain-gauge was cleaned, as well as the clock, and a new line was attached to the weight. One of the screws in the guiding rollers was found broken off in its socket ; this had to be drilled out, and a new one made.

T. W. B.

Fort William, August 21st–23rd.—The clocks of both barograph and thermograph decidedly required attention and cleaning.

The beat of the thermograph clock was bad, and the crutch bent. This was put right, and its performance is now much improved.

Endeavours were made to improve the dry-bulb zero curve.

The diaphragm on barometer-tube was shifted lower down.

New burners for the six lamps are wanted.

The photography seems to have improved of late ; I left written particulars fully describing the best procedure, and if these instructions are carefully carried out the improvement noted should prove permanent.

It was found that the Beckley rain-gauge emptied at about 0·195 inch instead of 0·200 inch. This was rectified as far as the thread would allow, and the emptying may now be considered as practically correct.

The clock, &c., was cleaned, and new line fitted.

E. G. C.

August 21st–22nd.—The instruments were all in excellent order, and the observations are made punctually, carefully, and correctly.

A. B.

Glasgow, August 17th–19th.—The self-recording meteorological instruments were all dismounted and cleaned.

The sperm oil for the direction roller bearings of the Robinson anemograph was in good condition, but the cup-bearing of the velocity spindle was nearly dry.

The " temperature-bar " of the barograph required taking down, and the diaphragm was removed and tube cleaned.

I found that the wet-bulb dots of the thermograph were out of focus, but I had to take off the rack of the lens to correct this ; the subsequent curve shewed an improvement.

The Beckley rain-gauge was in good order, and the " Stonyhurst " lifter was acting satisfactorily.

E. G. C.

August 24.—At this observatory, instruments and their positions and the observations are of a high order.

A. B.

Kew, October 28th.—Instruments all in good order. The wet-bulb standard thermometer was broken in March. Another Kew standard No. 788 was fitted up on April 24th, a spare thermometer being used temporarily. The shade maximum 19,081 in use in the thermograph screen for many years was removed in May, as its action had become uncertain, the column persisting in joining-up, and was replaced by maximum Hicks No. 872,334.

E. G. C.

Oxford, August 10th.—The self-recording meteorological instruments were all in very good order, and the curves satisfactory.

The usual annual examination, oiling, &c., was done.

The sperm oil for the direction roller bearings was fluid and clean.

The orientation was satisfactory.

The anemograph, rain-gauge, and both thermometer screens, have been recently painted; and a light iron fence has been placed, as a guard, round the rain-gauges and radiation thermometers.

E. G. C.

Stonyhurst, September 16th and 17th.—At this observatory all the instruments were going well, and the photography was good.

The standard wet-bulb themometer for eye observations was accidently broken on September 3rd, and the fact was duly reported to the Meteorological Office by the Rev. W. Sidgreaves. Another thermometer having a small spherical bulb was fitted up pending the arrival of a new standard. I entirely dismounted the exterior portions of the anemometer and found that all the bearings were well lubricated. As reported on my last visit, the direction fans are rapidly wearing away and one or two of the blades are now badly corroded, so that new fans should be supplied as soon as practicable. After oiling the clock and recording apparatus the orientation was examined and found correct.

The barograph was cleaned, as well as the temperature rod and its bearing; also the thermograph received due attention and the zero dots were shifted from the summer to the winter position. The rain-gauge clock was taken to pieces and cleaned and a new line attached to the weight, after which rubbings were taken of both the self-recording and spare funnels. A new pen and a small bottle of ink were supplied to this observatory. A fresh card of tables for the reduction of the barometer readings to 32° Fah., &c., is needed, the present one being much worn.

T. W. B.

Valencia, September 26th–29th.—The instruments were all inspected and found in good order, the clocks of the barograph and thermograph being cleaned and the light shutter of the latter re-adjusted.

The anemograph required painting externally, which was arranged to be done after the inspection, and at the same time Mr. Cullum promised to get mended one of the ties, which had just given way.

The anemometer was generally overhauled and all the bearings supplied with fresh sperm oil; at the same time the orientation was examined in the usual way and found correct.

The rain-gauge clock required cleaning, whilst a new line for the weight was attached and the usual rubbings of the funnels were taken.

T. W. B.

Group B.—Additional Anemograph Stations.

Alnwick Castle, August 14th–15th and September 2nd.—The Velocity traces appear to have been irregular since last winter, when the cups, &c., were damaged in a heavy gale, the curve gradually becoming worse, the spiral slipping about 10 miles very frequently, and the instrument has been out of action for some time past.

This anemometer is a very awkward one to do much with, owing to the long and complicated system of shafting in use between the exterior part on the tower and the recording part in the library, most of it being under the roof.

When the weather permitted, I dismounted, cleaned, and oiled the exterior portion—which appeared to be well looked after—and also examined the shafting under roofs. A pin was found to have worked out of the velocity rod, and it was only holding friction-tight. This was put right and reduced the slipping fault somewhat.

On my way South I paid another visit on September 2, and went carefully and thoroughly over the shafting and the various wheels and connections, and we finally found that the bottom ball bearing of the upright steel rod, gearing direct into the spiral pencil, was faulty and apparently worn, and the rod had dropped, causing the wheels to grind.

It was not possible, under the circumstances, to dismount the rod and bottom bearing from the slate slab on floor, as it would have taken considerable time, and free access to the library was not obtainable for several days, but as a temporary measure the rod was slightly lifted and a washer fitted, but the marking is still not quite satisfactory. The orientation could be taken as fairly good.

E. G. C.

Deerness, August 26th–27th.—The weather at the time of my visit was stormy and wet, and the examination of the anemograph was carried out under difficulties. It was dismounted and all parts cleaned. The oil was dirty, with a sediment. It was removed and fresh sperm used. One of the copper blades of the direction fan had broken off close up to the stem and this was repaired.

The clock was cleaned and lubricated, and the pencils attended to. Endeavours were made to correct the loop at the end of the direction spiral. The orientation was satisfactory. At Mr. Spence's request a new pin was fitted to the cylinder as the old one was much worn and would not hold the sheets. The faulty posts of the hut have been removed and three new ones fixed, as well as two new posts to the wire fence round the enclosure. Arrangements were made to complete the cementing of the stonework and about the new supports.

E. G. C.

Dublin, Phœnix Park, September 21st–22nd.—I found the small Robinson anemometer working satisfactorily, excepting that the direction vane was oscillating too freely. With the assistance of the overseer (Corporal Rose) who takes an interest in the work, I entirely dismounted the instrument, and cleaned all the bearings, including the brake-box; this was filled up with fresh sperm oil, and the other parts were attended to.

The clock being rather dirty, I had to take it to pieces, after which the orientation was examined and found correct. Since the last inspection the anemometer has been painted.

T. W. B.

Falmouth (*Pendennis Castle*), October 14th–15th.—The Dines' pressure-tube anemometer erected on the old Castle is now under the care of Mr. Venson, who has succeeded Mr. Burch as Chief Officer of the Coastguard at Falmouth.

I inspected the instrument in company with Mr. Kitto. At the time of our visit the wind was blowing very strongly, and it was noticed that the hut in which the recording apparatus is placed was vibrating considerably, and as the stand on which the container rests is fixed to the side of the hut it receives the full force of the shaking.

I first carefully examined the float and found that it was just a trifle low, about the thickness of the line on the pen rod. The water level was satisfactory, and so also was the adjustment of the pen to the paper. The gearing at the bottom of the clock spindle was found to be slightly loose, which would reasonably account for any difference previously shown between the curve and clock times.

I corrected this by pinching up the collar.

On dismounting the instrument a small quantity of water was found in the pressure tube and there was a slight whitish sediment at the bottom of the container. As regards the float, there was an appreciable deposit of oil on the top, this having found its way down the pen rod which had evidently been freely oiled from time to time.

The float was cleaned and replaced in the container, which was then re-filled with clean water. The lid was replaced and the apparatus fixed in position. The zero of the float was adjusted and the water brought to accurate gauge level and the instrument re-started. The vane worked very freely. Owing to the high wind at the time of inspection I was unable to dismount it, but I asked the observer to take it off and wipe it on the first calm day.

Mr. Venson was present during the greater part of these operations, and appeared to take an intelligent interest in all that was being done. He had not seen the instrument dismounted before, and was not aware of the screw valve for drawing off any condensed water that might accumulate in the pressure tube, and I also pointed out and gave strict instructions that on no account was oil to be applied to the pen rod. The anemometer sheets are sent by messenger every afternoon to the Custom House for exhibition.

I would also mention that additional guns are now being erected at the fort, of larger calibre and in closer proximity to the old Castle than any hitherto used, so that during gun practice I fear the instrument will be more seriously disturbed.

T. W. B.

Fleetwood, July 21st.—The entire instrument was dismounted and cleaned, and the velocity spindle was strengthened by an additional rivet before being replaced. Some re-adjustments of parts were made in "assembling" the instrument after cleaning, and the working of the instrument was very satisfactory when left. Mr. Gaulter is assisted in changing the sheets by Miss Hall, daughter of the caretaker of the Kiosk. Mr. Gaulter promised to ascertain whether the vane of this instrument points accurately with the wind; I had reason to suspect that it does not, but I was not able to ascertain definitely whether my suspicion was correct or not.

R. H. C.

Holyhead, July 14th–17th.—*Robinson Cup Anemometer.*—A spindle forming part of the reducing gear had become badly grooved and worn, and required to be repolished before being replaced; a slight re-adjustment of the plate carrying this portion of the instrument was made to prevent a recurrence of the undue friction.

Pressure-plate Anemometer.—A square plate of one square foot area was substituted for the circular plate hitherto used, and the spring was readjusted and all working parts of the instrument cleaned.

Bridled Anemometer.—This instrument was dismounted and cleaned, and the wheel-pen examined and improved.

Pressure-tube Anemometer.—The water in the container was again free from deposit and the instrument was working satisfactorily. The crippled mast had been well strengthened and is now apparently quite secure.

General.—All the instruments were in good order and appear to have been carefully attended to. The Office is again indebted to the courtesy of Capt. Kendall, who recently had the mast of the pressure-tube straightened free of cost at the forge of the Dublin Mail Packet Company.

R. H. C.

Kingstown, September 23rd.—The anemoneter here was going satisfactorily, the external parts being regularly attended to and oiled by the mechanic employed in the Harbour Yard, under the direction of Mr. R. D. Gray, C.E. I examined the exposed parts of the instrument and found that all the bearings were well lubricated. The orientation was tested, but was found a point or two in error. This, however, was corrected before starting the instrument again. The recording apparatus was also examined and oiled, and the clock cleaned.

By appointment, I met Mr. F. Dick, C.E., the chief engineer to the Board of Works, Dublin, to discuss details as to the raising of the instrument as suggested by Mr. Curtis. After due consideration, Mr. Dick was of opinion that there would be no difficulty in carrying out the proposed alteration, and decided to recommend the Board to erect an iron lattice column, about ten feet high, on the roof of the existing hut, to carry the anemometer, which would then bring the cups about 15 or 16 feet above the ridge of the roof. When this is carried out, there is no doubt that the value of the records obtained will be considerably increased.

T. W. B.

Scilly, October 3rd–6th.—At this station the instruments were in good order and appeared to be working satisfactorily. I dismounted the Robinson anemometer and found that all the bearings were well lubricated, but the brake-box was not full, and the oil was a good deal discoloured. All parts were cleaned and fresh sperm oil put in, and the instrument left in good order. The clock was also cleaned and the pendulum adjusted, after which the orientation was tested and found correct.

The Dines pressure-tube anemometer was next attended to. Before disturbing the instrument I noted the position of the zero of the float and pen, as well as the water-level, all of which were quite satisfactory. The clock, however, showed a tendency to gain, and this I endeavoured to regulate by moving the arm of the balance-spring. On taking down the container, the water proved to be clean and with but a very slight sediment. The float, as well as the container, were cleaned, the latter being refilled with fresh water. The lid was replaced and the zero of the float adjusted, whilst the water was brought to accurate gauge-level, and the instrument restarted. The palings round the hut are in a very shaky condition, and the whole of the anemometer requires painting. Mr. Hicks promised to have these things seen to before the winter sets in.

T. W. B.

Shields, North, August 12th.—The anemometer at this station decidedly required attention. It was dismounted, and all parts thoroughly cleaned and freshly lubricated.

The oil for the direction-roller bearings was fairly liquid, but very dirty. There was but little sperm in the cup bearing on velocity shaft, and hardly any on the step-bearing; and the direction fan-spindle was working stiffly.

The recording portion and clock were very dirty. The steel spindle, on which the recording-frames turn, had rusted, and the pencils moved very badly. I burnished the rod and oiled it, and left it in good order again.

The spiral on the direction-roller is short, and marks too heavily about N—NNW.

The clock was out of beat, and the lines had broken and been roughly repaired. I fitted new and stouter cords.

The flat brass spring for clamping the sheets on the drum had perished and broken off at one end, and the observer was using rubber bands; so I fitted a brass spiral spring to the clamp.

The trouble with the damp seems mainly due to condensation, and it is hard to see what more can be done to overcome it.

Since my last visit, six ventilators have been fitted round the chamber, and also a gas stove, with a long pipe for drying and outside outlet; but as long as the instrument remains in its present position the trouble with damp and dirt will always be more or less present.

Even under the best conditions the velocity trace is none too pronounced, and I had the counterpoise weight cut through, and instructed Mr. Robson to vary the weights and leverage during the damper months of the year.

E. G. C.

Shoeburyness, December 7th.—I have to report that as requested I visited Shoeburyness on the 4th inst. and examined the pressure-tube anemometer there.

The instrument had only recently been opened and refilled with the anti-freezing mixture recommended by Munro. The external portion of the instrument was clean, and is kept in excellent order.

The float was insufficiently weighted and did not descend to zero. This I corrected, and I then showed the sergeant in charge how to proceed with the daily adjustment of the instrument; I also changed the pen, and by altering its position with respect to the paper got a much better trace.

The tower vibrates readily, and in strong winds it no doubt shakes very much; and this may account for a good deal of the shake shown at times in the traces. But since these shakes are sometimes absent with strong winds, whilst they are very evident with much lighter winds, it does not appear that the movement of the tower is a full explanation of the phenomenon. I took with me two or three Meteorological Office sheets for trial upon the instrument, and I think these, with the readjustment of the pen, will probably together give better results.

For various reasons I think the use of the anti-freezing mixture undesirable, and I understood that a trial will be made of water, using a lamp to prevent it from freezing in times of frost.

At the request of Captain Haines I suggested a plan for recording the direction of the wind upon paper, in substitution for the dial now in use.

R. H. C.

Yarmouth, November 4th.—The anemometer had recently been to London for repair. It appeared to be in good working order, and in consequence it was not now dismounted.

R. G. K. L.

GROUP S.—ADDITIONAL SUNSHINE STATIONS.

Aberdovey, August 26th.—The recorder here is a Jordan (single chamber pattern), and is placed in an enclosure at the back of the Aberdovey Institute, and quite close to the sea. The observer has hitherto changed the papers at 8 a.m., and has entered the whole amount of sunshine to the previous day. In future he will change them each evening, after sunset.

F. J. B.

Durham, September 16th.—The sunshine recorder was clean and quite firmly fixed, and the scorch was satisfactory. The instrument appears to be carefully attended to.

J. A. C.

Ramsgate, July 23rd.—The sunshine recorder is on the roof of the building on the East Cliff occupied by the various municipal officials. A slight rise in the ground to the westward is probably not sufficient to materially affect the record at sundown. At about 4 feet from the recorder, on its eastern side, and on the same level, there is a row of six chimney pots, but the attendant states that only the one from the kitchen sends out smoke, other rooms having gas stoves and no coal fires.

H. H.

Rhyl, July 18th.—The thermometers and rain-gauge are now properly fitted up at the pumping station, where they are very satisfactorily exposed and are read by Mr. Hughes, one of the staff employed at the station. The barometer is exposed in High Street, where it can be seen by the public, and the observations, as also those of sunshine, are made by Mr. Polkinghorne. The borough surveyor, Mr. Goodall, has general charge of all the observations. The sunshine recorder had not been erected at the time of my visit, some difficulty having arisen with the Pier Company as to the site; it will, however, be erected forthwith. If desired, a suitable site for it can be had at the pumping station. This ought to become a very useful station.

R. H. C.

Skegness, September 7th.—The recorder is exposed on the roof of the pavilion at the end of the pier, which is 600 yards long. The height of the ball above the deck of the pier is 30 feet, and above M. S. L. 45 feet. The record was slightly interfered with by the roof, and I therefore raised the instrument about a foot. The adjustment was not correct, and the ball of the recorder was not central. I corrected these defects and securely clamped the instrument in its new position, where its exposure is practically perfect. The instrument is in charge of Mr. Cash, the pier master, under the direction of Mr. S. Coltmore Jones, Lord Scarborough's agent at Skegness.

I left careful instructions as to the method of dealing with the cards.

J. A. C.

Tenby, August 22nd.—The sunshine recorder here was in good condition. A short time ago the cards do not appear to have been changed regularly each evening. Steps have now been taken to remedy this. The observer was urged to send off his weekly returns on Monday in future (they have often arrived too late for insertion in the Weekly Weather Report), and also to despatch the cards regularly at the end of each month.

F. J. B.

York, September 12th.—The Bootham school was in vacation on the day of my visit, and Mr. Hugh Richardson, M.A., was absent, but I saw Mr. Stevenson, who has charge during the holidays. I found the recorder clean and in good order. The summer cards had been kept in use beyond the proper date, and to meet the difficulty thus created Mr. Stevenson had raised the recorder at the back two or three days before my visit.

The instrument was now, however, back in its place. To prevent a similar mistake in future I wrote out a list of the proper dates for changing the kind of card, and affixed the paper where the stock of cards is kept.

I found that the differences between the amounts sent up weekly and those supplied on the Monthly Form 19 were due to re-measurements made at the museum.

The adjustment for meridian was not quite exact, but I deemed it unwise to make any change.

J. A. C.

GROUPS D. AND E.—NORMAL CLIMATOLOGICAL STATIONS* (SECOND ORDER STATIONS of the INTERNATIONAL CLASSIFICATION).

Ackworth, The Friends' School, September 17th.—I found all in good order at this station except that the thermometer screen needed re-painting.

The observations are under the superintendence of the science master, Mr. H. B. Ludlam, M.Sc., who takes much interest in the work.

I was asked about a sunshine recorder, and as to whether the exposure was suitable should an instrument be obtained. I had not time to go upon the roof of the building, but, as far as I could judge from the ground, it would be easy to find an excellent position for a recorder if one could be got.

J. A. C.

Ampleforth, September 12th.—The observer, Rev. J. B. McLaughlin, O.S.B., was away, but I saw his deputy, Rev. Basil Mawson, O.S.B., who is both careful and competent.

The rain-gauge was not quite circular, and it was simply resting on the ground. I asked that the dent might be removed and that the instrument might be properly fixed at 1 foot above the ground. This it was promised should be done.

The thermometer screen is not of the standard pattern, but is quite satisfactory. I asked, however, that it might be raised by 6 inches.

The other instruments were in good order. Much interest is manifested in the work at this station, and the observations appear to be taken with great care.

J. A. C.

Belfast, August 11th.—The Robinson anemometer (erected in 1849), unreliable for many years, had broken down badly. The observer promised to record in future the force and direction of the wind by estimation, whether the anemometer was found to be working or not. The maximum thermometer in use was out of order, the continuity of the mercury being broken in four places. Another maximum will be used. Instrumental observations at this station appear to be made accurately, and recorded faithfully. I spent a considerable time explaining to the observer the requirements of the Office as regards non-instrumental observations.

C. H.

Bennington, September 30th.—This station was in good order. There was no change in the zero of the thermometers.

W. M.

Berkhamsted, October 9th.—This station was in good order. On comparing the thermometers it was found that the grass minimum had gone down 0°·6.

W. M.

Braemar, July 31st.—The instruments were all in excellent order, and the observations are made by Mr. Aitken with marked intelligence and fulness. Mr. Aitken is now running his 48th year as observer at Braemar.

A. B.

Bramley, July 15th.—The observations at this station are, so far as they go, of the best quality, but the great age of the observer, the fact that the instruments are the property of some one living elsewhere, and the difficulty experienced in finding anyone in the neighbourhood willing to give even temporary assistance in looking after the records, render it probable that the observations cannot be continued much longer unless the local authorities can be induced to make the station a permanent one to be looked after by one of their officials.

H. H.

Canterbury, July 21st.—Mr. Lander is the Secretary of the East Kent Scientific Society and takes great interest in the meteorological records for the district. The Annual Report of the Society contains photographic reproductions of the automatic registrations of various elements as recorded at Canterbury by Mr. Lander. He is willing to undertake the registration of ground temperatures at depths of 1 foot and 4 feet, and the Medical Officer of Health is prepared to submit to the Town Council a proposal that that body should defray the cost of the thermometers required.

H. H.

Carlisle, July 23rd.—This station is not in a satisfactory condition at present. The rainfall observations have been made for some time past with a scale fitted for a gauge of far larger aperture than the one in use, and the wet bulb was not properly mounted or wetted; both these elements have therefore been improperly registered. The solar radiation thermometer was placed upon the grass, and the light was cut off from the barometer by a large map. The observer promised to keep the wet bulb covered in future, but a new measuring glass can alone make the rain observations of any value.

R. H. C.

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* A Normal Climatological Station is one at which readings are taken each day at 9 a.m. and at 9 p.m., local time, and which is provided with the following instruments properly verified and exposed:—barometer, dry-bulb, wet-bulb, maximum and minimum thermometers, and rain-gauge.

Cheltenham, July 8th.—The instruments had been removed from the late Mr. Tyrer's residence to the Montpellier Gardens, and were placed in an enclosure 15 feet square. I recommended that the rain-gauge be moved to the position of the grass minimum thermometer, and that the rim be only 1 foot above the ground. The minimum and grass minimum thermometers had some spirit up the tube. On comparing the thermometers it was found that the wet bulb had gone up 0°·2, and that the minimum had gone down 0°·7. The barometer was placed in the pay office to the Montpellier Spa, which was a very confined and close room. The instrument was not hanging quite perpendicular. I recommended that it be removed, if possible, to the observer's house. I found that the observer had been reading and setting the minimum and the grass minimum thermometers at 9 a.m. instead of at 9 p.m.

W. M.

Chester, July 20th.—Mr. Mitchell was away from Chester, and the house was closed, so that I could get no information respecting the station.

R. H. C.

Cockle Park, September 15th.—I found everything in good order at this station, which is an excellent one in every way. The observer, Mr. J. H. J. Farquhar, B.Sc., is careful and competent, and takes much interest in the observations. It would be of interest and advantage if the earth temperatures at depths of 1 foot and 4 feet could be supplied.

J. A. C.

Dublin, Phœnix Park, September 21st–23rd.—All the instruments here were in good order, excepting that the screen minimum thermometer had about two degrees of spirit lodged in the upper part of the stem, whilst the grass minimum had one degree. The observer's attention was directed to this, and I showed him how to re-unite the column in case of any further separation.

The sunshine recorder required a trivial adjustment for latitude: this was easily performed by means of the adjusting screws of the new metal frame.

Since the last inspection the thermometer screen has been painted.

As to earth temperature observations, Colonel Sim informed me that he would not object to observations being taken provided the necessary thermometers were supplied by the Council. Colonel Sim thought that the water level would be about 6 feet below the surface of the ground, but if the Council desire it, he would have a hole dug on the site of the Stevenson screen and rain-gauge in order to see whether the depth of 6 feet would be quite free from water.

T. W. B.

Dundee, July 27th.—The instruments continue to be kept in excellent order, and the two observers evidence much care in securing that the observations are made with correctness and fulness. The instruments remain in the same places and under substantially the same conditions as when the station was established in 1866.

A. B.

Dunrobin, August 7th.—The instruments were all in very good order, and the observations are carefully and regularly made. The observer, Mr. Melville, was from home at the time of my inspection. The assistant observer on duty read the instruments with care and correctness.

A. B.

Durham, September 16th.—Mr. Carpenter, the observer, was absent on the day of my visit, but I saw Prof. Sampson, M.A., F.R.S., under whose direction the observations are carried on. I came to the conclusion that the abnormal temperatures occasionally observed are due to the shaking of the screen by the wind. At present the screen is supported by a central post. Prof. Sampson promised that this should be replaced by four legs in the ordinary way. I asked that when this alteration is made the maximum thermometer might be hung quite horizontally; it is now a little low at the bulb end. I pointed out the desirability of having earth temperatures, and Prof. Sampson promised to consider if this information could be supplied. The rain-gauge remains at its old height of over 3 feet above the ground A good exposure is now available at the regulation height, and I think it would be advantageous to have it lowered to 1 foot and placed on the grass.

J. A. C.

Eastbourne, July 17th.—The observer here is still an enthusiast in his work, and strives to be most exact in his records and results, but he realises that he cannot much longer devote to the work the same time and energy as in the past, and he is consequently training an assistant in every phase of observation, calculation, and attention to the various instruments, so that there should be no break in the continuity of the records at this station.

H. H

Fort Augustus, August 20th.—The instruments were all in excellent order, and the observations are made with special fulness and care, the movements of the clouds being more specially recorded.

A. B.

Fulbeck, September 4th.—The thermometer screen was not firmly fixed, but it was promised this should be corrected. The rain-gauge also was loose and not quite level; this I adjusted. With these exceptions the instruments were in excellent order. Mr. Willson continues his personal work in connection with the returns, and takes much interest in the observations.

J. A. C.

Garforth, September 17th.—The observations at this station are now under the superintendence of Dr. Crowther, Mr. Ingles having left the College Staff for an appointment in Africa. The observations are taken by Mr. Edwards, the Farm Manager, and by Mr. Smith, one of the assistants. Mr. Edwards was absent on vacation, but I saw Mr. Smith, who impressed me as being a careful and competent observer. The station was in good order, but the maximum thermometer is not satisfactory, the column being divided and the mercury being very apt to run up the scale. The grass minimum read 1°·5 lower than my standard. The grass around the rain-gauge was too long, and I asked that it should be cut.

I requested that the temperatures might in future be read to tenths of degrees.

The instruments were clean and well kept, and the work appears to be done with much care.

J. A. C.

Glencarron, August 18th.—All the instruments were in remarkably good order and are well observed.

Fuller reports of clouds and weather generally are promised.

A. B.

Gordon Castle, August 3rd.—The observations continue to be carefully and intelligently recorded, and the instruments were in admirable order. Eye observations of a fuller character are promised for the future. A sunshine recorder has not yet been added, but there is a prospect of this being done.

A. B.

Hull, September 9th.—The thermometer screen and rain-gauge were somewhat sheltered by trees and shrubs, and I approved a suggestion by Mr. Witty that the instruments should be removed to another site on the same level, about 100 yards distant, where the exposure would be much better. This change has since been carried out.

The sunshine recorder was not fixed in its position, but it was promised that this should be done at once. The ball of the recorder was not quite central in the bowl.

The grass minimum thermometer reads 2°·9 too low, and should be superseded.

Mr. H. B. Witty, the observer, is both careful and competent, and takes much interest in the work.

J. A. C.

Lairg, August 6th.—Since last inspection, August 11, 1902, a new rain-gauge and a new minimum thermometer were sent.

At first reading the station barometer read 0·030 inch lower than inspector's standard. On examination a small portion of air had got into the tube from an accident which was reported to us last spring. With a little trouble the air was expelled, and after hanging beside the standard for some time, it was found to read 0·015 inch lower, which was the error of this barometer in the past.

The instruments were all in very good order, and the observations were made carefully and correctly.

A. B.

Lednathie, July 28th.—The hygrometer and other instruments were in very good order, and the meteorological record from this station stands remarkably high.

A. B.

Lincoln, September 8th.—I called on the city surveyor, Mr. McBrear, and ascertained that the City had recently purchased a set of instruments, which were exposed in the grounds attached to the Sessions House. I was shown the instruments and found that the outfit comprised barometer, dry bulb, wet bulb, maximum and minimum thermometers in Stevenson screen, earth thermometers at 2 feet and 4 feet below the surface, and a 5-inch rain-gauge.

The instruments are of excellent quality, with Kew certificates, and observations are taken at 9 a.m. and 9 p.m. each day by Mr. Curtin, F.R.Met.Soc., the Chief Sanitary Inspector, and a junior assistant.

Copies of the observations are supplied to the local press, and a Negretti's Combined Chart is exhibited outside the Corporation Offices. The barometer is in a bad light, but the exposure of the other instruments is satisfactory, and in my opinion the readings may be taken as representing fairly the meteorological conditions of the City.

I inquired as to whether copies of the readings could be supplied to the Office if asked for. No definite reply could be given, but after conversation I formed the opinion that on application being made the observations would be supplied to us.

The returns had not been offered before, partly from want of confidence in them, the Station not having been seen and approved by any competent authority, partly because the results differ from those supplied by a private observer in the City, and partly too because it was understood the Office made a charge of £2 2*s*. a year for the publication in which the results would appear.

Observations have been made since the beginning of the year, and I recommend that the Office ask to be supplied with a monthly return on Form 19, from, at any rate, the beginning of 1904.

J. A. C.

Manchester, Oldham Road, July 24th.—The observer at this station was changed a few months since, the former observer having died. I found the station in very good order, and I think a great deal of care is taken to obtain good observations. The station admirably represents the City of Manchester, and is an important one on that account. A Campbell-Stokes sunshine recorder is now to be added to the equipment.

R. H. C.

Manchester, Whitworth Park, July 25th.—It is unfortunate that the instruments at this station have not been so well attended to as is desirable, and in consequence the wet bulb readings cannot have been reliable for some time past. The grass radiation thermometer was covered by a zinc screen which quite spoiled it for its intended purpose. The card in the sunshine recorder was also a winter one (inverted), with a small piece added at either end, and although the total sunshine for the day might be got from it, the times of the burns could not. Professor Schuster was out of England at the time of my visit.

R. H. C.

Markree Castle, August 18th.—All the instruments were clean and well cared for. The barometer is now quite reliable; the screw for making the cistern adjustment has been repaired. The mountings of the dry and wet bulb thermometers were in bad order, but while they are held intact by the screws the thermometers should still be efficient. The other instruments were in good order. The base of the sunshine recorder has been cemented in position; the instrument is in adjustment, level, and firmly fixed. For the rain-gauge on the ground a suitable receptacle for receiving moisture has been provided. A second rain-gauge, secured against the inside edge of the observatory wall, 16½ feet from the ground, is neither level nor firmly fixed, but is in fairly good order. The improved condition of this station is satisfactory and commendable; it is due to the energy of, and interest taken by, J. R. Armstrong, the new observer.

C. H.

Norwood, July 25th.—Owing to the growth of trees in a neighbouring garden a 5-inch rain-gauge was obtained some time ago and placed 17 feet north-west of the 8-inch gauge. For the first year there was no difference in the amounts collected by the two gauges, but in the second year the old gauge showed a slight falling off. The rainfall is now reported from the 5-inch gauge.

W. M.

Rousdon, August 13th.—This station was in good order. The sunshine recorder was placed in the Meteorological enclosure for the summer months. I recommended that it be removed to the anemometer tower, as the trees on the east-north-east and west-north-west were likely to cut off some of the early morning and late evening sunshine. The various self-recording instruments were in good working order. The "head" of the Dines anemometer had recently been cleaned, and a new spindle had been put in the Robinson anemometer. On comparing the thermometers it was found that the wet bulb had gone up 0°·2, and both the 2- and 4-ft. earth thermometers 0°·1.

W. M.

St. Leonards, July 18th.—Under the supervision of Dr. Colborne, the observations at this station are of the best quality, every care being taken to insure accuracy. The Gensing Gardens are about central as regards Hastings and St. Leonards, and the position of the station (for temperatures and rainfall) must be regarded as good for a town of hills and valleys, especially as there is an auxiliary station at West Marina, on the level of the parade.

H. H.

Scarborough, September 23rd.—A large dish of water was placed under the wet bulb thermometer. I recommended that this be removed, and a small glass vessel with a cover be used instead, The spot of light on the sunshine card was exactly on the central line, and on the hour line at 12 o'clock noon this day.

I saw the chairman of the Meteorological Committee, who was very desirous of having the instruments removed from the Peasholme allotments. The new site recommended is the lawn in front of the Town Hall. The reasons for this are that the instruments will be on Corporation ground, and that they will be much more accessible for the Observer. Also, being at the Town Hall, they will be more under supervision. The site is close to the cliff, but it is within a few yards of the spot where the instruments were placed some years ago. The instruments at the Manor Road Nursery are to be continued for at least a year, so it will be possible to see whether there is any difference between the various places. The sunshine recorder is to be placed on the tower of the Fire Station, where the exposure will be very good.

W. M.

Strathpeffer, August 18th.—Was visited on the 4th, 14th, and 18th, Dr. F. Fox's absence on professional duty and the want of sunshine deferring the full inspection till August 18th.

Height of barometer.—The position of a Bench mark was ascertained from Ordnance Survey map, the height given being 149 feet. Two aneroids gave each a difference of 0·060 inch of a fall to the cistern of Dr. Fox's barometer, the temperature of the air being at the time 57°·3, and the reading of the barometer, reduced to 32° F., 29·567. A height of 210 feet may be accepted as not more than 2 feet wrong.

Considering the hilly character of the situation the position of the various instruments is good, The instruments were all in remarkably good order, and were intelligently and well observed by Mr. McLean. Dr. F. Fox takes a general supervision of the work.

A. B.

Tealby, September 8th.—Everything was in good order at this station, except that the thermometer screen was not firmly fixed. This was due to the fact that the wooden posts supporting it were partly decayed. Mr. Lewin promised to remedy this defect by having new supports driven into the ground and secured to the present legs.

I was asked to pay special attention to the wet bulb. This I did, but I could discover nothing wrong, either with the instrument itself or with its mounting.

Mr. Lewin is an observer of much experience, and takes much interest in the observations.

J. A. C.

Wessington Court, August 29th.—The instruments at this station were all in a satisfactory condition, and the observations continue to be taken with care and intelligence by Mr. Lomas, the head gardener.

The thermometer screen is, as previously reported, too shallow to permit of a free circulation of air round the instruments.

F. J. B.

York, September 11th.—I found everything in very good order at this station, including the barometer, which could not be tested on the last inspection. The earth temperature is being recorded, at depths of one foot and four feet, and the earth thermometers agreed with my standard. The readings, however, are not at present supplied to us, and I suggest that Mr. Platnauer be asked to have them inserted on the monthly sheets.

J. A. C.

Group G.—Auxiliary Climatological Stations.

Aberystwyth, August 27th.—This station supplies observations which are despatched on post cards at 6 p.m. for insertion in the Daily Weather Report of the following day. The instruments are well exposed. The observations are made under the superintendence of Dr. Abram Thomas, the Medical Officer of Health, by one of the Inspectors of Nuisances, who appears careful and intelligent.

F. J. B.

Alnwick Castle, August 14th.—The instruments were in good order, but the Stevenson screen is not over grass, but it was promised that turf should be laid under and around it.

An 8-inch copper rain-gauge has been fitted up since my last visit, and is a decided improvement upon the old bottle gauge.

E. G. C.

Barnet, November 11th.—This station was started more than 20 years ago. Mr. Martin, who is in charge, was out when I arrived, but the clerk who looks after the office, and takes the observations, showed me the instruments, &c. Observations are taken carefully and systematically. While I was testing the thermometers Mr. Martin rung upon the telephone, and I had a lengthy conversation with him. He had not realized the nature of the work which the Office is doing in connection with the returns published by the Registrar-General, and was much inclined to resent any interference on the part of the Office. He informed me somewhat angrily that if I found fault with his instruments, he was not inclined to spend money in buying new ones. After some discussion, I succeeded in explaining to him the position which the Office holds with regard to the meteorology of the country, and finally Mr. Martin expressed a hope that an inspector would visit him again on some future occasion.

In consequence, perhaps, of this misunderstanding, the observer with whom I had to deal, though anxious to continue his observations on the accustomed lines, was averse to making any changes.

Temperature and rainfall observations appear to be satisfactory. The index correction of the barometer amounted to ·019 in., and that of the minimum thermometer to + 1°·7.

R. G. K. L.

Blackpool, September 12th.—The sunshine recorder was temporarily placed on the roof of the Sanatorium. The instrument was not quite level. There was a little spirit at the top of the tube of the minimum thermometer. The Negretti and Zambra self-recording rain-gauge needed overhauling and cleaning. A new site has been obtained for the instruments about half-a-mile to the north-east of the Sanatorium. An enclosure about 24 feet square has been railed off in a field, and about 60 feet to the north of it has been erected a brick building, on the top of which the sunshine recorder and the Dines anemometer are to be placed. The field belongs to the Corporation, and the exposure is very open. The instruments were to be removed to the new site very shortly.

W. M.

Bradford, July 22nd.—Mr Johnson was absent in London at the date of my visit, but I was shown the instruments by one of his assistants. The station has some drawbacks, owing to its being in the centre of Bradford, where it is probably impossible to find an entirely satisfactory site for the instruments. I suggested, however, that a rain-gauge near the thermometer screen might afford a useful comparison with the record from the gauge now used.

R. H. C.

Brundall, near Norwich, November 5th.—The station has been in existence for 20 years, and is in connection with the Royal Meteorological Society. Mr. Marriott had inspected it last year.

Observer is a solicitor; he has had long experience in taking observations, and appears to be alive to the importance of punctuality and accuracy. The wind observations are rather unsatisfactory, as the station is hedged in by tall trees. Observer has, therefore, been in the habit of recording the wind at Norwich by observing the direction of the vanes on the Cathedral. This necessarily throws the hour of observation forward to about 11 a.m. On Sundays, &c., observations are taken at Brundall by watching motion of smoke, &c.

R. G. K. L.

Caterham, July 25th.—As there has been no previous inspection of this station, and there has been no attempt to instruct the officials who see to the instruments, the observations are naturally of a rough and unsatisfactory character. It is, however, desirable that this Metropolitan "High Level" Station—at an elevation of about 600 feet, within less than 15 miles of the Meteorological Office—should be improved and rendered perfect. The situation is an ideal one, and as the institution is public and permanent, an endeavour should be made to substitute a complete set of new instruments—barometer, thermometers, rain-gauge, screen and sunshine recorder—so as to obtain a better knowledge of the atmospheric conditions at a spot where they seem to be very different from those prevailing in the neighbouring metropolis. The officials are intelligent and take a lively interest in the explanations of the phenomena which they are asked to record, so that with little trouble they could be trained to make very good and reliable returns. Dr. Campbell, the medical superintendent, had to be away in London on the day of the inspection, and it was, consequently, not possible to arrange for shifting the instruments to better positions.

H. H.

Chatham, July 24th.—The thermometers and rain-gauge have been moved from their former position, the ground being required for the erection of an astronomical and magnetical observatory. Advantage should be taken of the opportunity to improve the meteorological observations and place them on a more satisfactory footing. The screen now in use has the dry and wet bulb thermometers at 28 inches, instead of 48 inches, above the ground; the rain-gauge is wearing out, and the anemometrical records are misleading, as the cups are stationary when a perceptible breeze is blowing, and when they do revolve the friction is so great that the "grinding" can be heard in the rooms of the surveying officers, about 100 yards distant.

H. H.

Cirencester, August 17th.—A new thermometer screen (a Stevenson) has been set up since the last inspection in 1901. The legs upon which it stands are not firmly fixed, and with a high wind there is great risk of the thermometers being shaken.

The minimum thermometer reads 1° too low.

With these exceptions the station appeared to be in good order. The deputy observer, Mr. G. Smith, is quite capable, and appears to take a considerable amount of interest in the work.

F. J. B.

Clifton, August 19th.—The exposure of the instruments at this station leaves much to be desired. The thermometer screen is over bare stony ground, and is only 8 feet from the trunk of a large hawthorn tree. In the early morning the screen is quite shaded by the branches. A Richard thermograph has been placed in the screen, and in order to make room for this the dry and wet bulb thermometers have been placed quite close to the louvres on the right hand side. A better and more open site for the instrument is very desirable.

Mr. Rintoul was away at the time of my visit. I urged upon his deputy the desirability of obtaining earth thermometers. This suggestion will be brought to Mr. Rintoul's notice on his return from vacation.

F. J. B.

Colly Weston, September 19th.—Everything was in good order at this station, except that the thermometer screen was not firmly fixed, and that the rain-gauge, which was over bare earth, was sheltered by growing plants. Both these defects it was promised should be corrected at once. The instruments used for the observations sent to the Office were clean and accurate, and the work appears to be attended to with care.

J. A. C.

Edenfel, August 16th.—The observations contributed by Col. Buchanan have been made by him for a long period—for 35 years, I believe—and have been very carefully entered in a book, which forms a valuable record.

The position of this station appears to resemble that of Loughborough in its general characteristics.

With the exception of the rain-gauge, which required slight repair, the instruments were in perfect order, and the station is in every respect a satisfactory one.

C. H.

Felixstowe, November 3rd.—The exposure is good and the instruments were in good order. Observer took a set of temperature readings in my presence with accuracy and rapidity. I pointed out to him the chief errors that are usually made, the importance of checking his readings, &c.

He has succeeded in setting up his (Jordan) sunshine recorder correctly in spite of the fact that he had been informed by his predecessor that the instrument had to be placed with its axis in the magnetic meridian.

Rainfall is not measured at this station, but by a Mr. Alexander in the town. The gauge appeared to be in good condition; the gentleman was, however, not at home when I called.

R. G. K. L.

Halifax, Bermerside Observatory, July 24th.—From August 1st, Mr. Gledhill will read and set both the maximum and minimum thermometers at 9 a.m., entering the maximum reading to the day preceding the observation, and the minimum to the day on which the observation is made. No changes have been made here in equipment or in the position of the instruments since last year.

R. H. C.

Halifax, Public Library, July 24th.—Up to the present no change has been made in the methods followed at this station, and, as yet, they are not altogether those desired by the Office. Mr. Whiteley promised to fill up and send to the Meteorological Office Form 19; the point on which the principal difference exists is the time of reading and setting the maximum and minimum thermometers, and he again promised that these instruments shall in future be set and read at 10 a.m., the maximum reading being entered to the preceding day.

R. H. C.

Hawarden Bridge, July 20th.—The instruments are in good order, and appear to be carefully read by Mr. Rooney, the new observer, chemist at the adjoining iron works. There is apparently no reason to anticipate that the observations will be stopped, as Mr. Rooney is perfectly capable of carrying them on, and is willing to do so. The station is a considerable distance from Chester, and it is doubtful to what extent it represents the climate of the city.

R. H. C.

Killarney, September 30th.—I called at the asylum in the afternoon, but Dr. Griffin was not in; I saw him, however, the next morning and inspected the thermometers and rain-gauge.

The screen has not yet been changed and I found it in rather a shaky condition. It is quite different in pattern from the ordinary Stevenson screen, and has a solid bottom about 2 feet above the grass, whilst the roof is without a ventilator. I suggested that a ventilator be fitted in the roof, and that fresh supports or wooden stakes should be driven in the ground in order to steady the screen in high winds.

Dr. Griffin said that as soon as the resident carpenter had time a new screen would be constructed in accordance with the drawings sent him by the Meteorological Office.

There are no buildings to the south, but there are rather many shrubs and trees near the screen and the rain-gauge. The maximum and minimum thermometers are graduated on the stem and are by Negretti & Zambra. They are Kew verified, and I found them, on comparison, to be in close agreement with my standard.

T. W. B.

Kingstown, September 24th.—At the date of my visit Dr. Power was unfortunately confined to the house through illness, and, in consequence, was unable to accompany me to the People's Park, where the rain-gauge and thermometers are situated. I was able, however, to compare the barometer which is fitted up in his library.

I found the thermometers and rain-gauge in good order. The park constable, who has been instructed by Dr. Power to take the observations, read the instruments correctly.

The sun recorder is placed on the roof of the municipal buildings. It was slightly in error for latitude, which I corrected.

T. W. B.

Littlestone, July 20th.—The observer at this station is handicapped by having other duties to perform, while he has no one to assist him in taking any of the meteorological observations, the thermometers and rain-gauge being at a considerable distance from the tower, where the barometer and sunshine recorder are kept. He will, with a little tuition, develop into a very good observer.

H. H.

Llandovery, August 24th.—Dr. Rosser, who took over the instruments from the late Mr. J. Watkins, has hitherto been too busy to take observations, but has now expressed his willingness to resume the work. The position of the thermometer screen (about 5 feet from a garden wall) is not very good. Observer intends, however, to have the garden entirely re-arranged, and will endeavour to provide a better site.

F. J. B.

Llangammarch Wells, August 25th.—Dr. Black Jones, who is responsible for these observations, was unfortunately away at the date of the visit, and I was unable to get the corrections to the instruments, or even to learn whether they had been compared at Kew. The actual observer, a gardener, applies no corrections even to the barometer readings.

The site of the outdoor instruments is good, but the thermometer screen is far too small, and Six's thermometers are used for recording not only the maximum and minimum, but also the earth temperatures. The mounting of the wet bulb was very dirty ; observer, who had been there some years, told me that he had never changed it. Several defects were noticed in the methods of observing. Instructions were given with regard to these, but radical changes are essential before the station can be regarded as efficient.

F. J. B.

Newcastle-on-Tyne, September 14th.—All the instruments were in good order at this station, and the work continues to be carried out with care and intelligence by Mr. Robinson on behalf of Mr. N. H. Martin, F.C.S.

J. A. C.

Newton Rigg, July 22nd.—Mr. Lawrence, the Principal of the Agricultural School, is very anxious to make this station as good as possible, and he takes considerable interest in the work. A few points in which the methods adopted were not quite in accordance with the Office rules were mentioned, and the recommendations will be at once adopted. The position of the station leaves nothing to be desired, and I think it will prove to be a very useful and important one.

R. H. C.

Nottingham Castle, September 18th.—The instruments were in good order, and the observations are carefully and intelligently taken by a member of the City Engineer's Staff.

I compared the barometer and found it to read 0·032 lower than my standard. I requested that a further comparison might be made, the check barometer at the newly established telegraphic station being used for the purpose.

J. A. C.

Oundle School, September 19th.—This is a new station now being established. The outfit of instruments is good, and the exposure is excellent. The barometer is a "Fortin," and is hung in the physical laboratory. The outdoor instruments were not properly placed and I promised that directions for setting out the station should be sent, together with correction tables for the barometer readings.

I saw Dr. Saunderson, the head master, who is much interested in the work, and who gave directions for a sunshine recorder to be added to the equipment. There is a good exposure available for the recorder.

The usual difficulty as to the observations during the vacations could, I was informed, be satisfactorily met in this case. If this is so I think the station will be a very good one.

The observer is most anxious to do well.

J. A. C.

Portsmouth, July 14th.—This being the first visit paid to this station the observations generally are not so satisfactory as those at inspected stations, but the observer takes a most intelligent interest in the work, and gives promise of supplying very good reports in future. Greater attention will be given to the fitting of the damp bulb, the position of the sunshine recorder, and other matters.

H. H.

Port Talbot, August 20th.—The sunshine recorder was found some months ago to be out of adjustment and was returned to the Office for examination. It has since been sent back to the station and is now working satisfactorily. Owing to a shifting of the wooden post upon which it is fixed the level was not true. Steps were taken to remedy this. It would be an advantage if the records could be measured daily. At present no measurement is made before the cards reach the Office.

A rain-gauge has recently been started at this station, and the records are now sent to the Office. The guage is fairly, but not exceptionally, well exposed.

F. J. B.

Rauceby, September 5th.—The instruments at this station were in good order, and the observations are carefully and intelligently made. As reported last year, some amount of sunshine is lost owing to the surrounding trees, but no better position is available.

J. A. C.

St. Leonards, West Marina, July 18th.—This may be taken as the low-level station for temperatures and rainfall, being at the centre of a public lawn immediately in the rear of the sea front, and about 170 feet below the normal station in the Gensing Gardens. The instruments are well looked after and the records are reliable.

H. H.

Sandwich, July 22nd.—The exposure of the gauge at this station would be very good were it not for a few trees eight feet to ten feet high, at a distance of about five yards, on the western side of the lawn. As, however, the trees will be lopped and kept down as much as possible, the records will not be materially affected. Everything is clean and in good order, and the observations seem to be carefully taken.

H. H.

Shaftesbury, August 21st.—The column of spirit in the minimum thermometer was much broken up by air-bubbles; this I succeeded in getting right. The muslin and cotton on the wet bulb were dry, the end of the cotton not reaching to the bottom of the water receptacle, which was nearly empty. The rain-gauge, I learned, had been occasionally moved. I urged that it be kept in one place only.

W. M.

Swarraton, August 25th.—On comparing the thermometers it was found that the dry, wet, and maximum had gone up 0°·1. I gave the observer instructions as to the measurement of snow and as the management of the wet bulb in frost.

W. M.

Temple Bruer, September 4th.—This is a rainfall station, which had not been visited since 1899.

I found the gauge clean and firmly fixed, but somewhat out of level. I levelled it and left it in good order.

A row of peas shelters the gauge to some extent, but I asked that these might be removed for a sufficient distance, and this it was promised should be done at once.

The present observer is Miss Alice S. Morley, who takes a good deal of interest in the record.

J. A. C.

Wokingham, Pinewood, December 16th.—This is a new station, from which returns have not yet been received. The instrumental outfit is at present limited to the requirements of temperature and rainfall observations; there is a small anêroidograph, and also a Jordan sunshine recorder, but the last named instrument is not at present in use, owing chiefly to the absence of a satisfactory exposure for it. The situation of the instruments is excellent; and I think the observations—limited at present to 9 a.m.—will be carefully made, and that the station will be a permanent one. The thermometers and rain-gauge are very good instruments.

R. H. C.

Group H.—Fishery Barometer Stations.

Malin Head, August 13th.—The barometer is in charge of the Chief Officer of Coast Guard, and is in excellent order. The instrument is set daily at 8 a.m. and 8 p.m., the readings being recorded in a log book which is returned to the Admiralty. It read ·06 too high when my standard was at 28·91. I gathered from what the Chief Officer told me that the fishermen of the district find the barometer serviceable to them.

C. H.

Portrush, August 15th.—The barometer here is in good order. It read ·08 too low when the reading of my standard was 29·71. It is in charge of the Chief Officer of Coast Guard, and is said to be frequently consulted by the fishermen and seamen—through the watchman at the station. Telegrams from the Meteorological Office are shown in a frame on the wall enclosing the station house. The flagstaff had recently been broken and the cone to give the storm warning of the 14th (yesterday) could not be exhibited. One of the two M. O. thermometers at this station was in bad order.

C. H.

South Shields, September 15th.—I went to South Shields and made careful inquiry for the fishery barometer said to be exposed there, but could find no trace of it.

I visited all the barometers exposed for public use of which I could get information, but none of them answered to the M. O. instrument.

I recommend that inquiry be made as to the person to whom the barometer was originally issued, and as to what has become of the instrument.

J. A. C.

Group T.—Telegraphic Reporting Stations.

Aberdeen, July 29th.—This being the first inspection after the appointment of the new observer, the various instruments were carefully inspected, Mr. Clarke's handling of the same, and the records of the observations made. The instruments were all in good order, and Mr. Clarke gave evidence of being an accurate and expert observer. The estimated and the instrumental observations of wind force were examined. It is possible that the higher velocities recorded by the anemometer are due to its greater height as compared with the position where the wind-force is estimated. The unnecessary repetition of words in the Telegraphic Reports was gone into, and will no doubt be rectified in future reports. Professor Niven kindly was present during the inspection.

A. B.

Bath, August 18th.—This is a voluntary station, but owing to the liberality of the Corporation a complete 8 a.m. report is sent by wire each morning, and also a sunshine telegram in the evening.

The station is excellently exposed and the instruments were all in good condition. The sunshine recorder was not fixed in any way, and might easily be put out of position. I was, however, assured that a metal clamping arrangement had been ordered and was expected daily. I suggested that before securing the instrument a more perfect adjustment for meridian should be obtained.

F. J. B.

Birr Castle, August 19th.—The observers are now G. A. Roe for the Telegraphic Reporting section, and W. J. Roe for the Normal Climatological, both under the direct supervision of Dr. Otto Bœddicker, who was present during the inspection. G. A. Roe, a novice at the work this time last year, is now a good observer; his brother is a beginner at present and is anxious to become efficient.

All the instruments were clean and in first-rate order. The barometer at 29·65 inches read ·017 inch lower than my standard (corrected); the necessary correction will be applied in future. A small observatory has been erected 4 feet distant from the thermometer screen; Dr. Bœddicker will have the screen moved to a position selected as suitable.

C. H.

Brighton, July 16th.—The observations at this station seem to be carefully taken, and the 6 p.m. reports of other phenomena, in addition to the duration of bright sunshine, will probably be of considerable value in the preparation of forecasts, as they (the observations) will fall between the distantly situated Dungeness and Portland Bill, and afford some clue to the more local conditions in a district in which the public are greatly interested. It was suggested to the observer that the barometer should be removed to a position where the light would enable the readings to be taken with greater ease and certainty than in the darkness of the entrance hall.

H. H.

Clacton, November 3rd.—The instruments, &c., were in excellent order.

New legs are at present being fitted to the screen, as the old ones were found to be rotten; the present ones are only of temporary character.

The barometer readings are of little value for incorporation with other observations on synoptic charts, as the instrument is not one of standard type. No cloud observations are taken. With these exceptions, a complete set of observations of a second order station are taken, but at present the Meteorological Office only receives maximum, minimum, sun, rain, present weather, and weather for past 24 hours, by telegraph every morning.

Observations appear to be taken punctually and accurately.

R. G. K. L.

Donaghadee, August 12th.—Coastguardsman J. Busby, the principal observer, and in charge of the instruments at this station, was absent, serving afloat during the manœuvres. The coastguardsman entrusted with the work during his absence is an efficient and accurate observer; and had an equally capable assistant. I found the observing barometer ·007 of an inch too low, and the spare instrument ·005 of an inch too high. All the instruments were in good order.

C. H.

Dungeness, July 20th.—Mr. Williams had had no experience of meteorological observations when he took up his duties at this lighthouse, but he has since given a good deal of attention to the instruments and to the instructions, and will become a most trustworthy observer in time. Having been stationed at the Wolf Rock Lighthouse and at other points at the mouth of the Channel, his experience tells him that there is no comparison between the seas experienced about Land's End, and those off Dungeness—the latter are merely "wind-lops," which increase and subside with the wind, but he has not thus far seen anything in the nature of the ground sea of the west. Doubt having been cast on his record of a heavy snowfall last winter, Mr. Williams states that the storm was a very severe one, the fog horn having, in consequence, to be kept going for 16 hours, the depth of snow on the level being from a foot to 18 inches.

H. H.

Holyhead, July 17th.—The thermometer screen had not been repaired, an attempt which had been made to fasten the laths with glue had necessarily failed. Very long grass was growing around the rain-gauge, and this may have interfered with the record for some few weeks. The position of the barometers is not free from objection; at the time of my visit the sun was shining strongly upon the reporting barometer through a skylight just above it, and no satisfactory comparison of its attached thermometer could be made.

The instruments were clean. The attention of the observer was called to two or three matters which required special remark.

R. H. C.

Leith, August 26th.—The instruments were all in excellent order, and the observations made by the observer and assistant with commendable care and correctness.

A. B.

Malin Head, August 14th.—Mr. Hailstone and his assistant, Mr. Doherty, were both in attendance during my visit of inspection, and the latter gave readings of the barometer and thermometers, as well as the former, and was closely questioned by me in regard to the work. Turf has now been laid down in the enclosure where the screen stands. The screen is in good repair, and has been painted recently; the thermometers were all clean, well marked, and in good order; but the minimum reads 0°·8 too high at 56° Fahr. I have instructed observers to make corrections accordingly.

The spare barometer is used when the Standard is affected by sun's rays; this occurs occasionally during the summer months. The spare instrument reads ·011 too low, and I have told observers to make the necessary correction before reporting the reading.

I adjusted the self-reading aneroid. The pen of the instrument makes too thick a trace, and Mr. Hailstone says it requires replenishing with ink twice a week. I recommend a new pen.

C. H.

Margate, July 23rd.—Mr. Stokes has been a meteorological observer for over a quarter of a century, and his evening reports consequently should form a valuable addition to the information on which the forecasts are based. The station being situated at the mouth of the Thames and close to the most frequented shipping route, the observations will be of more than local interest.

H. H.

Nairn, August 4th.—New dry and wet bulbs have been added since last inspection. The instruments were all in good order, and much care is taken to secure accuracy in making the observations and despatch in sending them to London.

A. B.

Nottingham, September 18th.—This is a newly established station. The barometer hangs in a small wooden house, on a brick pier specially built to carry it without vibration. The out-door instruments are placed in an enclosure 27 feet by 18 feet, neatly turfed and surrounded by an open iron fencing. The thermometer screen was not quite firmly fixed, and I asked that the legs might be strengthened.

The sunshine recorder is exposed on a wooden post, approached by an iron ladder. It would be better if a small platform could be constructed independent of the post so as to allow the observer to change the cards. At present, ascending the ladder tends to shake the instrument. To lessen risk of damage I asked that the ball should be cemented to the pillar. The adjustment of the recorder was not quite right, but I made the requisite corrections, and left it in good order.

Mr. Ings, the observer, was absent on the day of my visit, but I saw Mr. Wessleby, the deputy observer, who read the instruments accurately, and who will, I think, make a very good observer.

Mr. Brown, the city engineer, under whose superintendence the station has been established, takes great interest in the work, and is anxious to do all in his power to ensure its success.

J. A. C.

Oxford, August 10th.—The meteorological instruments are all in very good order and there is nothing calling for special remark.

Both screens have been recently painted, and a couple of earth thermometers added to the equipment.

E. G. C.

Pembroke (*St. Ann's Head*), August 21st.—This station was, generally speaking, in an efficient state. A new dry bulb thermometer is required, and I ordered that the thermometer screen should be repainted.

Instructions were given respecting the necessity for giving further details relating to gales, and also as to the necessity for sending off the reports more promptly.

F. J. B.

Portland Bill, July 13th.—The observations at this station are limited to the requirements of the daily weather reports. They are telephoned at 8 a.m. and 6 p.m. (the latter including the 2 p.m. set) to Easton, and thence transmitted by telegraph to London. Other than the monthly return sent to the Meteorological Office, no record of the observations is kept, the codified (original) messages on "Post Office Telegraphs, Form A" being kept for a few months in case of an enquiry, but are then destroyed. To insure the permanency of the original records at this and similar stations it would be well to have set forms for registering the 8 a.m., 2 p.m. and 6 p.m. observations for future reference.

H. H.

Scilly, October 3rd–6th.—All the instruments were satisfactory, excepting that about one degree of spirit had become separated from the main column in the minimum thermometer. This I put right, and showed the observer how to re-unite the column in the event of its getting out of order again.

At the end of August Mr. Hicks removed the two barometers and self-recording aneroid from the signal station and fitted them up in the anemometer hut.

On inspecting the instruments I found that the space inside the hut was so confined that in the summer time the barometers would be a good deal affected by temperature. In consequence I thought it best to remove the recording aneroid and the observing barometer to Mr. Hicks' private house, where I had them fitted up.

The height of the barometer is about 6 feet above the roadway, the latter being approximately 14 feet above sea level.

T. W. B.

Shields, North, August 13th and September 3rd.—The instruments generally are in fair condition, but the porcelain scales are poor.

The Stevenson screen needs painting, and the door is in bad repair, and several louvres are missing, but it could be repaired locally. The legs seem firm enough.

The rain-guage is dented in several places (no new thing here), but the rim is fairly good.

The screen and rain-gauge are still quite unprotected.

E. G. C.

Stornoway, August 17th.—As regards the reports, the observer says that in future more individual attention will be given to the making and despatch of the observations.

Mr. Mackenzie explains that frequently the sea disturbance at Stornoway is occasioned, not by local winds, but by heavy seas from the Atlantic approaching Stornoway round by the Butt of Lewis. Special attention will be given to these observations.

As regards special telegrams, the observer promises to give special attention in future, and a similar remark applies to the use of the figure "6."

The screen for the thermometers and other instruments will be changed to the new position as soon as certain draining operations have been carried out, say some time in September.

The instruments were in very good order and the observations are carefully made.

A. B.

Sumburgh Head, August 12th.—Shortly after last inspection a complete change of thermometers and screen was carried out at this station. These and all the other instruments were found to be in excellent order and the observations continue to be correctly and carefully made. As Mr. Brand has some difficulty in understanding the kind of cases shewn by his Richard barograph desired by the Office, it might assist him if the Office selected from the cards recently received from Dunrossness several such cases, with remarks thereon; the end in view would be more readily apprehended than by any merely verbal descriptions.

Mr. Brand promises to supply the Office regularly with readings of his mercurial barometer at 10 p.m. or 11 p.m.

A. B.

Valencia Observatory (*Cahirciveen*), September 26th–29th.—At this station I found all the instruments in good order, excepting that the sunshine recorder required a slight adjustment for latitude.

T. W. B.

Wick, August 8th.—The instruments were all in very good order, and the observations appear to be carefully made.

The remarks regarding the reporting of gales not in accordance with instructions, the time of commencement, ending, and extreme force, and neglect in answering letters for a long time, and sometimes entirely overlooking them altogether, were read over to the observer. The necessity of amendment was enforced.

A. B.

Yarmouth, Norfolk, November 4th.—The station is in a satisfactory condition generally. No change has been made in the position of the instruments or management of the station. No correction is at present applied to the readings of the dry bulb, and, according to my test, a correction of $-1°{\cdot}0$ ought to be applied.

The minimum reads $1°{\cdot}0$ too low.

Observer complained of the ink supplied by the office for his self-recording aneroid; he declares that it dries up very much more rapidly than that supplied formerly used to do. The pen was in an extremely dirty state, and would hardly write. Washing it in spirit improved this, and a satisfactory trace is now being obtained.

R. G. K. L.

COMPARISON OF INSTRUMENTS.

The following tables give the corrections required to be applied to the readings of the various instruments to make them agree with the Inspector's standards :—

BAROMETERS.

OBSERVATORIES.

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
ENGLAND AND WALES.	Inches.	Inches.	Inches.	
Falmouth	—	—	—	Not tested.
Kew	—	—	—	Not tested.
Oxford	—	—	—	Not tested.
Stonyhurst	—	—	—	Not tested.
SCOTLAND.				
Aberdeen	29·489	− ·003	− ·006	
Ben Nevis	—	—	—	Not tested.
Fort William	29,715	+ ·005	—	
Glasgow	29·698	+ ·004	—	
IRELAND.				
Armagh	29·975	+ ·001	—	
Valencia	29·416	+ ·012	+ ·006	

TELEGRAPHIC REPORTING STATIONS.

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
ENGLAND AND WALES.	Inches.	Inches.	Inches.	
Bath	29·653	+ ·001	—	
Brighton	29·777	·000	—	
Dungeness	30·103	+ ·003	+ ·011	
Holyhead	29·577	− ·001	+ ·004	
Jersey	—	—	—	Not visited this year.
London (Brixton) ...	—	—	—	Not visited this year.
Margate	29·771	− ·002	—	
Nottingham	30·293	− ·001	− ·023 ?	
Pembroke	29·664	+ ·012	+ ·007	
Portland Bill	29·910	− ·004	− ·003	
Scilly	29·638	+ ·004	− ·001	
Shields, North	29·889	+ ·009	+ ·004	
Spurn Head	29·784	+ ·010	+ ·009	
Yarmouth	30·471	− ·001	+ ·007	
SCOTLAND.				
Leith	29·852	·000	·000	
Nairn	29·394	+ ·004	+ ·014	
Stornoway	29·670	− ·002	+ ·008	
Sumburgh Head	29·686	− ·004	− ·006	
Wick	29·502	− ·004	− ·006	
IRELAND.				
Birr Castle	29·647	+ ·017	—	
Blacksod Point	—	—	—	Not visited this year.
Donaghadee	29·907	+ ·007	− ·005	
Malin Head	28·813	− ·007	+ ·011	
Roche's Point	—	—	—	Not visited this year.

BAROMETERS.

NORMAL CLIMATOLOGICAL STATIONS (Second Order Station, International Classification).

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
ENGLAND AND WALES.	Inches.	Inches.	Inches.	
Ackworth	30·189	− ·009	—	
Ampleforth	29·267	− ·009	—	
Bramley	29·822	+ ·005	—	
Canterbury	30·201	− ·008	—	
Carlisle	29·692	+ ·036	—	
Chester	—	—	—	
Cockle Park	30·255	− ·005	—	
Durham	29·901	− ·002	—	
Eastbourne	29·698	·000	—	
Fulbeck	29·791	− ·006	—	
Garforth	30·065	+ ·006	—	
Hull	29·753	− ·004	—	
Manchester, Oldham Rd.	29·770	+ ·010	—	
Manchester, Whitworth Park.	29·880	+ ·012	—	
St. Leonard's	29·558	·000	—	
Tealby	29·696	+ ·016	—	
Wessington Court ...	29·588	·000	—	
York	29·448	+ ·004	—	
SCOTLAND.				
Ben Nevis	—	—	—	
Braemar	28·714	·000	—	
Dundee	29·651	+ ·001	—	
Dunrobin	30·030	+ ·002	—	
Fort Augustus	29·371	+ ·001	—	
Glencarron	29·122	+ ·014	—	
Gordon Castle	29·356	+ ·004	—	
Lairg	29·540	+ ·015	—	
Lednathie	28·914	+ ·002	—	
Strathpeffer	29·436	·000	—	
IRELAND.				
Belfast	29·831	+ ·003	—	
Birr Castle	29·648	+ ·022	—	
Dublin, City	29·963	+ ·004	—	Mean of 4 comparisons.
„ Phœnix Park ...	29·699	− ·005	—	
Markree Castle	29·547	− ·001	—	

OTHER CLIMATOLOGICAL STATIONS.

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
ENGLAND AND WALES.	Inches.	Inches.	Inches.	
Barnet	30·186	− ·019	—	
Bradford	—	—	—	
Brundall, near Norwich	30·611	+ ·050	—	
Caterham	29·452	+ ·107	—	
Chatham	29·839	− ·002	—	
Halifax, Bermerside ...	—	—	—	
„ Public Library ..	—	—	—	
Littlestone	30·125	·000	—	
Llangammarch Wells ...	29·482	− ·009	—	
Newcastle-on-Tyne ...	30·371	− ·002	—	
Newton Rigg	29·241	+ ·003	—	
Nottingham Castle ...	30·116	+ ·032	—	Doubtful; time not sufficient.
Oundle School	—	—	—	No comparison made.
Portsmouth	30·069	+ ·007	—	
Truro	30·155	+ ·025	—	
SCOTLAND.—None.				
IRELAND.				
Kingstown	30·185	+ ·002	—	

THERMOMETERS.

OBSERVATORIES.

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Grass Minimum.	Spare.	REMARKS.
	°	°	°	°	°	°	°	
ENGLAND AND WALES.								
Falmouth	54·5	−0·6	0·0	−0·5	+0·1	—	—	Wet standard broken; this thermometer was temporarily in use.
Stonyhurst	51·4	−0·1	−0·5	−0·1	+0·4	—	—	
Oxford	58·6	−0·1	−0·1	—	—	—	—	
Kew	?	−0·1	0·0	−0·2	−0·1	—	—	Compared Jan., 1903.
SCOTLAND.								
Aberdeen	53·2	−0·1	−0·7	0·0	+0·3	—	—	
Ben Nevis	50·2	0·0	0·0	—	0·0	—	0·0	
Fort William	57·5	0·0	0·0	0·0	0·0	—	—	
Glasgow	56·5	−0·2	−0·1	−0·2	+0·2	0·0	—	
IRELAND.								
Armagh	55·1	−0·4	−0·5	0·0	−0·1	−0·3	—	
Valencia	59·6	−0·7	−0·5	−0·2	0·0	—	—	

TELEGRAPHIC REPORTING STATIONS.

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Grass Minimum.	Spare.	REMARKS.
	°	°	°	°	°	°	°	
ENGLAND AND WALES.								
Bath	58·1	− 0·2	0·0	0·0	+ 0·1	+ 0·4	—	There is a spare min. here with no error, which will be used in future.
Brighton	61·7	− 0·8	—	—	− 0·8	+ 0·2	—	
Clacton-on-Sea	51·0	0·0	0·0	0·0	+ 0·2	—	—	
Dungeness	66·0	0·0	0·0	0·0	0·0	—	—	Instruments only read to whole degrees.
Holyhead	58·6	− 0·3	− 0·4	− 0·3	+ 0·2	—	− 0·3	
Jersey	—	—	—	—	—	—	—	Not visited.
London, Brixton	—	—	—	—	—	—	—	Not visited.
Margate	63·0	0·0	0·0	0·0	+ 0·6	—	—	
Nottingham	58·5	0·0	—	—	+ 0·5	—	—	
Oxford	58·6	− 0·3	− 0·3	− 0·3	+ 0·2	—	+ 0·8	
Pembroke	57·2	− 0·4	+ 0·1	− 0·8	0·0	—	—	No spare thermometer at this station.
Portland Bill	62·0	0·0	+ 0·5	0·0	+ 0·5	—	0·0	Instruments only read to within half a degree.
Scilly	59·5	− 0·7	− 0·5	− 0·7	0·0	—	− 0·3	
Shields, North	59·5	− 0·1	− 0·3	− 0·2	− 0·2	—	+ 0·7	
Spurn Head	59·2	− 0·4	− 0·1	0·0	− 0·3	—	—	
Yarmouth	51·5	− 1·0	− 0·2	0·0	+ 1·0	—	0·0	
SCOTLAND.								
Aberdeen	55·7	0·0	− 0·1	− 0·1	0·0	—	—	
Leith	59·1	− 0·1	− 0·2	0·0	+ 0·3	—	− 0·2	
Nairn	60·8	0·0	+ 0·1	0·0	+ 0·3	—	0·0	
Stornoway	56·7	− 0·1	− 0·1	0·0	+ 0·3	—	− 0·1	
Sumburgh Head	55·2	0·0	0·0	− 0·1	0·0	—	− 0·2	
Wick	56·6	0·0	0·0	0·0	+ 0·2	—	− 0·2	
IRELAND.								
Birr Castle	57·3	− 0·5	+ 0·1	− 0·3	+ 0·1	—	− 0·3	
Blacksod Point	—	—	—	—	—	—	—	Not visited.
Donaghadee	57·2	− 0·6	− 0·6	0·0	+ 0·1	—	− 0·1	
Malin Head	56·3	+ 0·2	0·0	+ 0·1	− 0·8	—	+ 0·1	
Roches Point	—	—	—	—	—	—	—	Not visited.
Valencia (Cahirciveen) ...	59·5	0·0	0·0	− 0·5	0·0	0·0	− 0·2	

THERMOMETERS.

NORMAL CLIMATOLOGICAL STATIONS (Second Order Station, International Classification).

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Grass Minimum.	Spare.	REMARKS.
ENGLAND AND WALES.	°	°	°	°	°	°		
Ackworth...	54·9	− 0·3	− 0·3	− 0·1	0·0	—	—	
Ampleforth	52·0	− 0·1	− 0·1	0·0	+ 1·0	—	—	
Bennington	59·5	− 0·1	− 0·1	− 0·2	− 0·2	+ 0·5	—	Earth therm. 1 ft. − 0·1 4 ft. —
Berkhamsted	58·0	− 0·4	− 0·3	0·0	0·0	+ 0·6	—	Earth therm. 1 ft. 0·0 4 ft. —
Bramley	58·2	0·0	0·0	+ 0·3	+ 1·1	—	—	
Canterbury	62·2	0·0	− 0·3	− 0·3	+ 0·2	− 0·3	0·0	
Carlisle	57·0	− 0·4	− 0·6	− 1·0	− 1·0	—	+ 0·4	
Chester	—	—	—	—	—	—	—	Insts. not tested.
Cheltenham	57·7	− 0·3	− 0·5	− 0·6	+ 1·5	+ 0·7	—	
Cockle Park	50·6	− 0·1	0·0	− 0·3	+ 0·7	+ 0·1	—	
Durham	51·1	− 0·8	− 0·7	+ 0·1	+ 0·1	+ 0·5	—	
Eastbourne	65·0	0·0	—	0·0	0·0	—	—	
Fulbeck	64·0	+ 0·1	− 0·1	+ 0·1	0·0	—	—	
Garforth	57·0	0·0	− 0·1	− 0·1	0·0	+ 1·5	—	
Hull	56·6	− 0·5	− 0·4	− 0·3	+ 0·1	+ 2·9	—	
Manchester, Oldham Road	63·5	− 0·5	− 0·5	+ 0·1	− 0·1	− 0·2	—	Earth therm. 1 ft. + 0·2 4 ft. + 0·2
„ Whitworth Park	62·0	− 1·3	− 0·1	+ 1·3	+ 0·2	+ 0·1	—	
Norwood	64·9	− 0·8	− 0·8	− 0·8	− 1·4	0·0	—	Earth therm. 1 ft. + 0·1 4 ft. —
Rousdon	58·1	− 0·2	+ 0·1	+ 0·1	+ 0·7	0·0	—	Earth therm. 1 ft. − 0·2 4 ft. − 0·3
St. Leonards	68·0	− 0·5	− 0·7	0·0	0·0	—	—	Earth therm. 4 ft. 0·0
Scarborough	58·1	0·0	0·0	− 0·1	+ 0·6	—	—	
Tealby	54·7	− 0·2	− 0·3	− 0·8	+ 0·5	—	− 0·2	
Wessington Court ...	60·8	− 0·2	− 0·2	− 0·2	+ 0·1	− 0·2	—	
York	54·0	− 0·3	− 0·6	− 0·2	0·0	—	—	Earth therm. 1 ft. 0·0 4 ft. 0·0
SCOTLAND.								
Ben Nevis	50·2	0·0	0·0	—	0·0	—	0·0	
Braemar	55·4	− 0·5	− 0·5	− 0·1	0·0	—	—	
Dundee	58·3	+ 0·5	+ 0·5	− 1·2	+ 0·4	—	—	
Dunrobin	57·7	0·0	0·0	+ 0·1	+ 0·1	—	—	
Fort Augustus	53·5	− 0·2	− 0·2	− 0·2	+ 0·4	—	—	
Fort William	57·4	− 0·2	− 0·2	0·0	+ 0·2	+ 0·3	—	
Glasgow	58·0	0·0	0·0	0·0	0·0	0·0	—	
Glencarron	54·1	− 0·2	− 0·2	+ 0·1	+ 0·2	—	—	
Gordon Castle	56·5	0·0	+ 0·3	0·0	+ 0·4	—	—	
Lairg	56·0	0·0	0·0	+ 0·2	+ 0·1	—	—	
Lednathie	55·0	− 0·2	− 0·2	− 0·2	+ 0·3	—	—	
Strathpeffer	59·5	0·0	0·0	+ 0·1	0·0	—	—	
IRELAND.								
Armagh	55·1	− 0·4	− 0·5	0·0	− 0·1	− 0·3	—	
Belfast	58·8	+ 0·1	0·0	+ 1·3	+ 0·6	—	—	
Birr Castle	57·3	− 0·5	+ 0·1	0·0	+ 0·1	—	− 0·3	
Dublin, Phœnix Park ...	62·6	− 0·4	− 0·6	− 0·5	+ 0·5	+ 0·5	—	
Markree Castle	58·2	− 0·2	− 0·2	− 0·6	0·0	− 0·1	− 0·4	

THERMOMETERS.

OTHER CLIMATOLOGICAL STATIONS.

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Grass Minimum.	Spare.	REMARKS.
ENGLAND AND WALES.	°	°	°	°	°	°	°	
Aberystwyth	—	—	—	—	—	—	—	Insts. not tested.
Alnwick Castle	55·3	− 0·2	− 0·3	− 0·4	+ 0·2	—	—	
Barnet	49·8	− 0·5	− 0·5	− 0·2	+ 1·7	− 0·2	—	
Blackpool	—	—	—	—	—	—	—	Insts. not tested.
Bradford	—	—	—	—	—	—	—	Insts. not tested.
Brundall, near Norwich	49·9	− 0·1	+ 0·1	− 0·1	− 0·2	− 0·1	—	
Caterham	65·7	− 0·5	− 0·3	+ 0·7	+ 1·2	0·0	—	
Chatham	68·8	− 0·2	− 0·2	− 0·2	+ 0·3	—	− 0·2	
Cirencester	63·0	+ 0·1	+ 0·1	+ 0·2	+ 1·0	+ 1·8	—	
Clifton	57·5	− 0·7	− 0·4	+ 0·4	− 0·2	+ 1·2	—	
Colly Weston	56·7	− 0·1	+ 0·5	− 0·3	+ 0·1	—	—	
Felixstowe	52·0	0·0	+ 0·2	+ 0·2	+ 0·5	—	—	
Halifax, Bermerside ...	—	—	—	—	—	—	—	Insts. not tested.
„ Public Library...	—	—	—	—	—	—	—	Insts. not tested.
Hawarden Bridge ...	62·9	—	—	− 0·1	+ 0·9	—	—	
Littlestone	66·0	0·0	0·0	0·0	+ 0·2	—	—	
Llandovery	—	—	—	—	—	—	—	Insts. not tested.
Llangammarch Wells ...	57·5	− 0·4	+ 0·8	− 0·3	0·0	—	—	Earth therm. 1 ft. − 1·0 4 ft. 0·0
Newcastle-on-Tyne ...	54·0	0·0	0·0	− 0·3	+ 0·1	—	—	
Newton Rigg	54·5	− 0·5	− 0·5	− 0·8	0·0	—	—	
Nottingham Castle ...	60·9	—	—	+ 0·6	0·0	+ 0·3	+0·1	Earth therm. 1 ft. − 0·4 4 ft. − 0·2
Oundle School	—	—	—	—	—	—	—	Insts. not tested.
Portsmouth	69·0	0·0	0·0	+ 0·5	+ 0·5	0·0	—	Earth therm. 1 ft. − 0·5 4 ft. 0·0
Rauceby	66·2	− 0·3	0·0	− 0·6	+ 0·4	—	—	
Rhyl	63·0	0·0	− 0·1	0·0	+ 1·0	0·0	—	
St. Leonards, West Marina	73·0	− 0·2	− 0·2	+ 0·1	0·0	—	—	
Shaftesbury	—	—	—	—	—	—	—	Insts. not tested.
Swarraton	56·2	0·0	− 0·1	− 0·7	− 0·2	—	—	
Truro	63·9	0·0	− 0·2	− 0·1	− 0·2	—	—	
SCOTLAND.—None.								
IRELAND.								
Edenfel	51·7	− 0·8	—	+ 0·5	− 0·3	—	− 0·1	
Killarney	56·7	—	—	0·0	0·0	—	—	
Kingstown	57·4	− 0·1	+ 0·1	+ 0·2	+ 0·5	—	—	

816. *Typewriter* (Minute 782).—It was resolved to accede to the request of the Controller of the Stationery Office (M.O. 3,017) to postpone the requisition for a typewriter until 31st March next.

817. *Office Staff.*—Reported the following arrangements for boy messengers :—

P. Lundie appointed from 14th April at 8*s.* 6*d.* per week to be raised to 10*s.* from January 3rd, 1904.

J. S. Edwards appointed from 23rd November at 7*s.* 6*d.* per week in place of S. Elsdon resigned.

818. *Accounts.*—(i.) A form of notification to inquirers of the rule of the Council in regard to payments for information asked for by letter was approved.

—— (ii.) A payment of £5 12*s.* 6*d.* to Mr. W. H. Dines for cost of maintaining the base station at Crinan during the period of the kite ascents of the summer of 1903, July 10th to August 31st, was approved.

—— (iii.) *Telegraphic Stations.*—It was resolved that the usual bonus of £3 3*s.* be given to those of the telegraphic observers who have discharged their duties faithfully during the year (Minutes 1,878, p. 22).

—— (iv.) Submitted—The following statement:—

	£	*s.*	*d.*
Cash balance on 1st December	2,938	4	3
Receipts from 2nd to 15th December	86	10	9
	3,024	15	0
Cheques drawn from 2nd to 15th December ...	222	8	9
Cash balance on 15th December	£2,802	6	3

63, *Victoria Street, S.W., 13th January*, 1904.

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN. | PROFESSOR DARWIN.

MR. SHAW (*Secretary*).

819. The Minutes (802–818) of the last meeting 16th December, 1903, were read and confirmed.

820. *Instruments: Callendar Recorder* (Minute 810).—The Secretary was authorised to make arrangements with the Cambridge Scientific Instrument Company for the installation of apparatus for charging cells for working the Recorder, on the basis of the letter from the Company (M.O. 3,038), provided that the cost does not exceed £25.

821. *Pilot Charts for Indian Ocean: Proposed Issue* (Minute 805, ii.).—Submitted —A memorandum by the Marine Superintendent (M.O. 129), prepared in pursuance of Minute 805, ii.

The Secretary was directed to forward a copy to the Meteorological Reporter to the Government of India, with a covering letter explaining that the proposal would be further considered by the Council after the receipt of Mr. Walker's comments.

822. *Publications: Weekly Weather Report.*—The Secretary submitted proposals for the alteration of the form of the Weekly Weather Report drawn up by Mr. J. Curtis, and was directed to obtain specimen proofs of a new form, embodying proposals for alteration, for the consideration of the Council.

823. *Antarctic Expeditions: Auxiliary Meteorological Observations.*—Reported—The receipt of Observations at 0h. G.M.T., from 26th December, 1902, to 31st March, 1903, from the "Scotia," the vessel of the Scottish National Antarctic Expedition, including an observation at 70° 21′ S., 17° 12′ W. on 22nd February, 1903.

824. *Colonial Observations.*—(i.) The Secretary reported that he had received a letter from the Foreign Office (M.O. 5) asking for 12 copies of the Meteorological and

Hydrographic Observations in Uganda up to the end of 1902, and had replied in a letter enclosing proof copy of the title page, &c., of the publication of Tropical African Observations (Minute 693, 763), and explaining why the observations of lake levels were not summarised in that volume.

Approved.

(ii.) Reported—Receipt of M.O. 3,082 from the British Vice-Consul, Mogador, offering observations of rainfall.

Approved.

825. *Pilot Charts of North Sea and Baltic: Deutsche Seewarte.*—Reported—M.O. 3,103 from the Seewarte covering the first issue of a Quarterly Pilot Chart for the North Sea and Baltic, and asking for expressions of opinion and suggestions for improvement.

826. *Publications: Presentation Copies.*—The Secretary was directed to send the Daily Weather Report, until further order, to the Cambridge Observatory, and to G. T. Bennett, M.A., Fellow and Lecturer of Emmanuel College, Cambridge, who is engaged in Mathematical investigations in connexion with the motion of air in cyclonic storms.

827. *Royal Meteorological Society.*—The Secretary was authorised to send, as in previous years, a note of the work done in the Office in the past year, to be included in the Report of the Council of the Society (M.O. 112).

828. *Logs.*—Fourteen received, one excellent—Captain Hurford; two abbreviated logs.

829. *Storm Warnings*:—

Warnings were issued on 11 days, the total number of districts warned being 71.
In 23 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 28 districts by subsequent strong winds (force 7 or 6). In 20 districts the warnings were not required.

Gales experienced without Warning.—None.

F. J. BRODIE.

830. *Forecasts, Supply.*—The Secretary reported that he had undertaken to supply Messrs. W. Watson and Sons, 313, High Holborn, with a forecast for the London District by telephone daily at about 10.30 a.m., to be supplemented by a printed copy of the forecasts delivered by hand later in the day, for 10s. per quarter.

Approved.

831. *Instruments—Quarterly Return*:—

RETURN of SERVICEABLE INSTRUMENTS in the OFFICE and at HIS MAJESTY'S DOCKYARDS for the QUARTER ending 30th SEPTEMBER, 1904.

Place.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available 1st July, 1903	83	85	143	61	59	44
	Received, new	—	—	—	—	—	—
	„ repaired and cleaned.	7	33	—	—	—	—
	Total	90	118	143	61	59	44
	Issued	24	39	55	19	17	3
	Total available 1st October, 1903.	66	79	88	42	42	41

RETURN of ADMIRALTY INSTRUMENTS for the QUARTER ending 30th SEPTEMBER, 1903.

Depôts.	BAROMETERS.								THERMOMETERS.															
	Mercurial.				Aneroid.				Ordinary.				Maximum.				Minimum.				Screens.			
	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.
†Portsmouth	25	25	—	—	55	46	—	9	150	142	—	8	50	62	12	—	50	67	17	—	25	19	—	6
†Devonport	25	17	—	8	55	52	—	3	150	131	—	19	50	46	—	4	50	43	—	7	22	19	—	3
Chatham	25	19	—	6	55	25	—	30	150	138	—	12	50	42	—	8	50	43	—	7	25	18	—	7
†Sheerness	6	4	—	2	15	7	—	8	30	21	—	9	10	10	—	—	10	9	—	1	10	10	—	—
Queenstown	5	4	—	1	10	9	—	1	15	15	—	—	8	8	—	—	8	8	—	—	—	3	3	—
(Dockyards, Home) Total	86	69	—	17	190	139	—	51	495	447	—	48	168	168	12	12	168	170	17	15	82	69	3	16
Gibraltar	2	3	1	—	2	2	—	—	4	8	4	—	3	3	—	—	3	3	—	—	—	—	—	—
†Malta	11	12	1	—	15	14	—	1	60	54	—	6	10	11	1	—	10	11	1	—	1	1	—	—
Bombay	4	2	—	2	3	2	—	1	10	2	—	8	4	3	—	1	4	—	—	4	1	2	1	—
Halifax	3	1	—	2	4	4	—	—	20	10	—	10	4	4	—	—	4	2	—	2	1	1	—	—
Bermuda	3	2	—	1	4	3	—	1	20	20	—	—	4	4	—	—	4	3	—	1	1	1	—	—
Jamaica	3	3	—	—	2	4	2	—	10	10	—	—	2	2	—	—	2	2	—	—	1	1	—	—
Cape of Good Hope	7	3	—	4	8	5	—	3	33	25	—	8	8	5	—	3	8	4	—	4	2	2	—	—
Trincomali	3	2	—	1	3	2	—	1	10	12	2	—	4	5	1	—	4	4	—	—	1	1	—	—
†Hong Kong	17	7	—	10	21	11	—	10	87	30	—	57	21	16	—	5	21	21	—	—	5	11	6	—
†Sydney	5	—	—	5	6	6	—	—	25	14	—	11	6	5	—	1	6	5	—	1	1	1	—	—
Esquimalt	4	4	—	—	5	12	7	—	15	27	12	—	2	3	1	—	2	4	2	—	1	2	1	—
(Dockyards, Abroad) Totals	62	39	2	25	73	65	9	17	294	212	18	100	68	61	3	10	68	59	3	12	15	23	8	—
Grand Totals and Net Shortage at Depôts	148	108	—	40	263	204	—	59	789	659	—	130	236	229	—	7	236	229	—	7	97	92	—	5
Meteorological Office... ...	45	66	21	—	120	79	—	41	250	88	—	162	80	42	—	38	80	42	—	38	50	41	—	9
Repairing	—	—	35	—	—	—	29	—	—	—	12	—	—	—	10	—	—	—	8	—	—	—	—	—
Returnable from Depôts ...	—	—	18	—	—	—	30	—	—	—	13	—	—	—	2	—	—	—	5	—	—	—	—	—
Ordered	—	—	—	—	—	—	—	—	—	—	198	—	—	—	30	—	—	—	15	—	—	—	10	—
Net Surplus or Shortage at M.O.	—	—	74	—	—	—	18	—	—	—	61	—	—	—	4	—	—	—	—	10	—	—	1	—
Proposed to be Ordered ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

† Supplies have been sent since 30th September, 1903.

NOTE.—No change has occurred in the Stocks of Hydrometers.

9th January, 1904.

R. F. WALLACE.

832. *Forecast Districts* (Minute 597).—The Secretary reported that Mr. Gaster had been unable to attend at the Office since 27th November in consequence of ill-health, and that he had employed Mr. W. D. Matthews, at a cost of £10, to complete the tabulations that had been commenced for the stations in the North-Western District. He also submitted tables of results for the three years 1896–1898.

The payment was approved, and the Secretary was directed to prepare the tables for printing, with explanatory text.

833. *Inspector's Reports* (Minute 815 ; *see also* 814).—Authority was given for the following :—

i. The repair of the direction fans of the anemograph at Stonyhurst in the manner indicated by Mr. R. Curtis (M.O. 130).

ii. To make further inquiry about the Alnwick anemograph (p. 64).

iii. To make inquiry of the Observer at Caterham with a view to his obtaining a set of new instruments (p. 73).

iv. To make inquiry as to the anemometer and other instruments at Chatham (p. 73).

v. To make inquiry about the missing fishery barometer at South Shields, and generally to arrange that an annual note of acknowledgment and safe custody should be obtained from all custodians of fishery barometers.

vi. To report further upon a proposal for improving the approach to the North Shields anemometer (M.O. 131).

Dr. Buchan undertook to make further inquiry as to the six lamps required for Fort William (p. 63).

834. *Accounts: Audit.*—Reported—That the cash accounts for the quarter ended the 30th September last had been this day examined by Prof. Darwin and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st July last, when there was a balance of £1,765 18*s.* 9*d.*, were £4,011 4*s.* 2*d.* against £3,764 18*s.* 5*d.* in the corresponding period of the preceding financial year. The payments were £3,816 10*s.* 2*d.* against £3,786 7*s.* during the same period in the previous year. The balance in hand and at the bank on the 30th September amounted to £1,960 12*s.* 9*d.*, and at the same date in 1902 to £1,668 14*s.*

835. *Accounts.*—Submitted—The following statement :—

	£	*s.*	*d.*
Cash balance on 15th December, 1903	2,802	6	3
Receipts from 16th December, 1903 to 12th January, 1904	4,900	8	11
	7,702	15	2
Cheques drawn from 16th December, 1903 to 12th January, 1904...	1,573	0	7
Cash balance on 12th January	£6,129	14	7

836. *Reports of Work* for the month of December were submitted and approved.

837. *Library.*—A list of publications received since the last meeting of the Council was laid on the table.

63, *Victoria Street, S.W., 27th January*, 1904.

PRESENT:

PROFESSOR DARWIN (IN THE CHAIR).

THE HYDROGRAPHER. | MR. SHAW (*Secretary*).

838. The Minutes (819–837) of the last meeting, January 13th, were read and confirmed.

839. *Publications* (O. 123), Minute 805 (i).—The question of the republication of O. 123 (Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand, 1899, 12*s.*) was referred to the Hydrographer for report.

840. —— (O. 168).—Reported—that the series of Wind Charts for the South Atlantic had been completed and signed for press.

Resolved—that the Marine Superintendent draw up introductory remarks to accompany the charts as in the case of the charts of the Southern Ocean (O. 123).

841. *Marine Observations.—Foreign Steamship Companies* (Minute 808).—After discussion it was agreed that the Secretary apply to a selection of the companies named in Minute 808 at his discretion.

842. *Daily Charts for the Indian Ocean.*—Read—the following letter from Sir J. Eliot:—

(M.O. 225.)

Alipore, Bengal,
December 31st, 1903.

SIR,

I HAVE the honour to ask your assistance in relation to data for marine charts. It has been decided by the Indian Government to publish a daily weather map covering an area considerably larger than that of the series of daily maps published by this Department some years ago. The area, of which a rough sketch map [lat. 50° N. to 45° S., long. 20° to 120° E.] is sent, is to include parts of Europe, Siberia, Australia and Africa; most important of all it will include the region of permanent high pressure in the ocean east of Cape Colony.

2. It has been found that the abnormal conditions of the past seven years, with their droughts in Australia, Africa and India, have been associated with abnormal pressure conditions over a very large portion of the earth's surface; and it is to be hoped that these charts will enable light to be thrown on a number of questions of scientific interest as well as of economic importance.

3. At the present time we make daily maps uniform in area with those formerly published, and get at Calcutta and Bombay copies of logs from ships calling at those ports. By extending this system to Colombo we could increase the number of observations on the direct routes between India and South Africa and between India and Australia; but we should get hardly any readings at all in the intermediate space. And this intermediate space, including the high pressure area, is probably more important than any part of the sea area. It is crossed by vessels going round South Africa to Australia, but many of the vessels do not call at Cape Town, and the best way to get meteorological observations within this area would seem to be to ask for assistance at London, Washington and Hamburg.

4. I infer from the Pilot Charts published by you that you get ship observations of the kind that we are in need of: and that your assistance might be of the greatest service.

5. I am confident that we can rely on your sympathy in the project: and I should regard it as extremely kind if you would give me your advice as to the best method of sending us the data in question—whether you could lend us your copies of the logs after you have used them or whether you would prefer that copies should be made for us of those readings which concern us. In the former case we would of course undertake to return the logs as quickly as possible. In the

latter case I will try to arrange for any payment that may be necessary. I should also like to have some idea of the number of observations per day that we could get from you in the area of the proposed map. Would many of these be in the region of the permanent high pressure area ?

6. I do not think it would be possible to get the maps published until about a year after date : otherwise incompleteness would result, and in maps published for scientific purposes delay is not serious evil. Probably it would, therefore, be sufficient if you could send us a batch of readings once a month.

7. We intend to make daily maps as soon as possible, and hope to begin publishing the maps at January 1st, 1905, if we find that we can get sufficient observations to cover the area.

I have, &c.,
JOHN ELIOT,
Meteorological Reporter to the Government of India
and Director-General of Indian Observatories.

Dr. W. N. Shaw, M.A., F.R.S.,
Secretary to the Meteorological Council,
63, Victoria Street, Westminster, London.

and a memorandum thereupon by the Marine Superintendent :—

In reference to the letter from Sir John Eliot, M.O. 225, dated December 31st, 1903, should the Council decide to publish a Monthly Pilot Chart of the Northern portion of the Indian Ocean, and, in connexion with it, issue to Captains of Ships, with a request for meteorological observations, forms somewhat similar to Form No. 51, we may expect a few months after its issue to be in receipt of about 90 returned forms per month—say, on an average, about three daily,—supplying data relating to pressure, sea and air temperature, wind, weather, and sea. In addition, about six daily observations recorded in logs will be available.

This material could be forwarded to India after it had been made use of at this Office, say three months after its receipt.

At present we receive observations (in addition to those recorded in logs) on about two forms only per month supplying the material required. As yet we have not asked for Indian Ocean Observations on Form 51.

The publication by the Meteorological Department of the Government of India of Daily Synoptic Weather Charts of the Indian Ocean, for the furtherance of Land Meteorology, appears to fall in well with the publication of the Monthly Pilot Chart proposed, which would deal mainly—though not wholly—with monthly means for the sea areas, for the furtherance of Ocean Meteorology, and in the interests of Shipping.

It is suggested that forms for recording observations might with advantage be issued to Captains of Ships six or eight months in advance of the issue of the first Pilot Chart, with a note relating to the publication of the monthly series proposed.

The accompaying chart shows the tracks on which vessels run from which obervations are received.

The Secretary was directed to write to the Meteorological Reporter stating what information is at present available for the purpose indicated and explaining the circumstances with regard to the proposed issue of Monthly Pilot Charts for the Indian Ocean (805 ii, 821).

843. *Weekly Weather Report—Monthly Summary.*—The Secretary was authorised to modify the form of the Monthly Summary of observations so as to include the information given in the monthly summaries of the S.S.O. volume and obviate the necessity for issuing two official sets of monthly summaries.

844. *Rainfall Tables—British Isles.*—Read—the following letter :—

(M.O. 248.)

2, St. Margaret's Road, Oxford.
January 20th, 1904.

DEAR SIR,

. . . . . .

COULD you kindly also inform me if there is any likelihood of the Office issuing a further set of Tables for the period 1891–1900 ? I am at present engaged on an investigation connected with the movements of underground waters, and I find it essential to have the monthly values of rainfall. The records for the dry period 1891 to 1900 would be of the greatest value.

I have, &c.,
H. N. DICKSON.

The Secretary,
Meteorological Office,
63, Victoria Street, S.W.

845. *Colonial and Foreign Observations*—(i) *Ocean Island* (Minute 807).—Submitted—the following memorandum by the Marine Superintendent :—

On January 13th I called at the office of the Pacific Islands Company, Limited, and had an interview with the Secretary, Mr. A. J. Reeves. He informed me he had brought the matter referred to in Dr. Shaw's letter of January 7th before his Board, and was in a position to promise that if the Meteorological Council were good enough to lend instruments to Mr. P. F. Money, their Medical Officer on Ocean Island, the privilege would be appreciated and the observations of value to them. They would give instructions for the instruments to be well cared for, a continuous record of observations kept, and the same forwarded to the Meteorological Office from time to time. In the event of Mr. Money's retirement from the post, his successor should carry on the work of observing. Mr. Reeves, the Secretary, asked what instruments would be lent, and advised that they should be consigned to the care of the Pacific Islands Company, 120–123, Fenchurch Street, E.C.

Consideration postponed.

—— (ii) *Casa Blanca, Morocco.*—The Secretary reported that at the suggestion of Mr. A. M. Madden, H.M. Vice-Consul at Mogador, he had written to ask Mr. G. H. Fernan, of Casa Blanca, to forward to the Office his records of rainfall.

Approved.

846. *Antarctic Expeditions* (Minutes 567, 623, 737, 758).—The Secretary reported that he was informed by the Secretary of the Royal Society that the Royal Geographical Society, in reply to an inquiry as to the means to be proposed for dealing with the Meteorological Observations, anticipated that the cost of dealing with them would be defrayed from the proceeds of sale of the "Discovery," and were prepared to guarantee £500. That the conditions of the proposed guarantee were not clear and that he had undertaken to draft a letter for the Royal Society in consultation with Professor Larmor to define the terms upon which the Council would take over the reduction of the observations if requested by the Society.

Approved.

847. *Instruments.*—A requisition for six thermometers for H.M. Newfoundland Survey was referred to the Hydrographer.

848. *Logs.*—Five received, none excellent. Two abbreviated registers.

849. *Storm Warnings :—*

Signals hoisted on 5 days ; total number of districts warned, 19.

In 11 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 4 districts by subsequent strong winds (force 6 or 7). In 4 districts they were not required.

Gales experienced for which no warnings were issued.—None.

850. *Forecasts for the Admiralty.*—Read—the following letter :—

(M.O. 125.)

Admiralty,
January 12th, 1904.

SIR,

WITH reference to your letter No. M.O. 2,652 of November 6th last, relative to the despatch of telegraphic weather reports to the Portsmouth Destroyer Flotilla when cruising, I am commanded by my Lords Commissioners of the Admiralty to inform you that the Lords Commissioners of His Majesty's Treasury have authorised the acceptance by the General Post Office of telegrams of this nature to the three Home Destroyer Flotillas without prepayment, and the Postmaster-General has accordingly been asked to cause arrangements to be made with your office as to the Post Office at which it will be convenient for these telegrams to be handed in.

I am to request that you will move the Meteorological Council to be good enough to allow similar reports to be sent to the Medway and Devonport Flotillas, those already sent to the Portsmouth Flotilla having proved of great value.

Arrangements will be made for all programmes of Flotilla cruises to be forwarded direct to your Office, and the commanding officers of each Flotilla will be instructed to notify you immediately by telegraph of any variation from the programme.

I am, &c.,
EVAN MACGREGOR.

The Secretary,
Meteorological Office,
63, Victoria Street.

The Secretary reported that after consulting the Chairman he had given instructions for the forecasts to be sent as requested, and had replied to the letter and asked that the Devonport forecasts and storm warnings for dockyards should be accepted on the same terms as the forecasts for the Flotilla cruises.

Approved.

851. *Forecasts.*—Submitted—the following report on the Forecasts issued at 8.30 p.m. daily during the month of December, 1903 :—

The letters used have the following signification :—

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	52	65	59	
,,	b	39	26	32	91
,,	c	6	6	6	
,,	d	3	3	3	
Scotland, E.	a	55	65	60	
,,	b	20	16	18	78
,,	c	19	13	16	
,,	d	6	6	6	
England, N.E.	a	61	61	61	
,,	b	26	32	29	90
,,	c	7	7	7	
,,	d	6	0	3	
England, E.	a	58	71	65	
,,	b	23	23	23	88
,,	c	10	6	8	
,,	d	9	0	4	
Midland Counties	a	45	52	49	
,,	b	20	35	27	76
,,	c	29	10	20	
,,	d	6	3	4	
England, S.	a	65	68	67	
,,	b	29	23	26	93
,,	c	3	6	4	
,,	d	3	3	3	
Scotland, W.	a	48	68	58	
,,	b	29	23	26	84
,,	c	13	6	10	
,,	d	10	3	6	
England, N.W.	a	39	61	50	
,,	b	26	26	26	76
,,	c	22	10	16	
,,	d	13	3	8	
England, S.W.	a	42	71	57	
,,	b	29	26	27	84
,,	c	23	0	12	
,,	d	6	3	4	
Ireland, N.	a	45	65	55	
,,	b	23	29	26	81
,,	c	19	3	11	
,,	d	13	3	8	
Ireland, S.	a	35	61	48	
,,	b	26	23	25	
,,	c	26	13	19	73
,,	d	13	3	8	
Summary.					
British Islands	a	50	64	57	
,,	b	26	26	26	83
,,	c	16	7	12	
,,	d	8	3	5	

852. *International Telegraphic Service, Skegness.*—Submitted the following report from Mr. Brodie :—

In accordance with instructions I visited Skegness on Friday, January 15th, for the purpose of establishing a telegraphic reporting station.

Immediately on arrival I called upon Mr. S. Coltmore Jones, Agent to the Earl of Scarborough, the principal landowner in the district. Mr. Jones will be immediately responsible for the reports, but the observations will be made by his gardener, Mr. William Allen, who appears to be a man of considerable intelligence. In Mr. Allen's absence the observations will be taken by Mr. Woollett, an ex-chief officer of the Coast Guard.

The various instruments, which I took down with me, were placed in the following positions :—

*Barometer.**—This was suspended in Mr. Jones' office, the height of the cistern being 16·1 feet above mean Sea Level. The height was obtained by levelling from a bench mark on the railway station, about 200 yards distant.

*Thermometers.**—The Stevenson's screen was erected in an open piece of turfed ground, known as the Marine Gardens, and extending for some considerable distance along the front between the parade and the beach. The site is an exceptionally open one.

Rain Gauge.—The rain gauge was firmly fixed in a drain pipe at a distance of 15 feet from the screen.

Enclosure.—The screen and gauge are enclosed within an open iron railing, 3 feet high. This was in course of erection when I left the station on Saturday afternoon. Barbed wire is to be placed at the top of the railing so as to keep out all intruders.

Sunshine Recorder.—This had been in position for some months, and was inspected in the autumn. The exposure, on the dome of the pavilion at the end of the pier, is, in my opinion, a perfect one.

Wind Observations.—The direction will be obtained as a rule from a vane on a high flagstaff in the Marine Gardens. The vane works freely, but no cardinal points are attached. I determined by compass the correct true bearings, which were marked out by stakes in the ground. Allen is quite inexperienced in observing wind, and will therefore be assisted for a time by Mr. Woollett, who from his former position is well qualified for such observations.

Dispatch of Reports.—These will be sent by telephone from Mr. Jones' office to the Post Office. I impressed upon the observers the importance of sending off the messages *promptly*. The first message arrived here this morning.

Payment of Observer.—This will be at the rate of 2*s.* 6*d.* per week for the first three months, as authorised by Dr. Shaw.

A rough sketch plan of the station is attached herewith.

Approved.

853. *Accounts.*—Submitted—The following statement :—

	£	*s.*	*d.*
Cash balance on 12th January	6,129	14	7
Receipts from 13th to 26th January	211	3	5
	6,340	18	0
Cheques drawn from 13th to 26th January	301	12	6
Cash balance on 26th January	£6,039	5	6

854. *Library.*—A list of publications received since the last meeting was laid on the table.

* I would suggest the inadvisability of supplying Barometers with a large correction,—at all events to stations at a very low level. The correction of the instrument at Skegness varies from —·012 in. at 30·5 ins. to —·019 in. at 28·5 ins., and as a result the "correction for height," when the barometer is low, becomes *subtractive*, instead of *additive*. This is rather confusing to inexperienced observers.

63, *Victoria Street, S.W.*, 10*th February*, 1904.

PRESENT :

SIR R. STRACHEY (IN THE CHAIR).

MR. BUCHAN. | THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

855. The Minutes (838-854) of the last meeting (27th January) were read and confirmed, and a revised proof of the Minutes 802–818 was signed.

856. *Forecasts for the Admiralty* (Minute 850).—Read—the following letter :—

M.O. 333.

Admiralty,
4th February, 1904.

SIR,

WITH reference to your letter No. M.O. 125 of the 20th ultimo on the subject of the transmission of weather reports to this Department, I am commanded by my Lords Commissioners of the Admiralty to inform you that the private wire from the Admiralty to the Central Telegraph Office, being only available, under existing arrangements, for the despatch of messages, cannot be used for the receipt of communications from your office, and their Lordships do not consider that the transmission of the Daily Report and occasional further messages would justify the maintenance of a special wire for the purpose.

If, however, there is no objection to continuing the present arrangements as regards occasional messages, such as Storm Warnings, my Lords are prepared to send a messenger from this Department for the Daily Weather Report which it is understood is issued at a fixed time each day.

Should you concur in this proposal, I am to request that their Lordships may be informed of the exact time at which the messenger should call at the Meteorological Office.

I am, &c.,
EVAN MACGREGOR.

The Secretary,
Meteorological Office.

It was agreed to concur in the proposal of the Admiralty.

857. *International Telegraphic Service.*—Submitted—the following letter together with a memorandum and draft letter to the Seewarte in reply :—

M.O. 224. (Translation.)

Deutsche Seewarte,
Hamburg,
22nd January, 1904.

I HAVE to thank you for your very obliging letter of the 14th instant (M.O. 3,062), and to express the satisfaction of the Deutsche Seewarte that the service of telegraphic weather reports from the British Islands will soon take the form that has been desired for some years.

As soon as we receive separate telegrams from Skegness, which are welcome in place of Yarmouth, and those from Portland Bill, the morning collective telegrams from London should cease, viz., the telegrams containing observations from Sumburgh Head, Shields, Blacksod Point, Holyhead, Scilly, Portland Bill, Aberdeen, and Roche's Point, and also the telegram with observations from Stornoway, Valencia, and Yarmouth.

It must, however, be understood that as soon as these collective telegrams are discontinued, as stated in the letter of the 17th January, 1901 (No. 345), all the stations will include in their separate telegrams the morning observations with 3 groups. Accordingly, from the middle of September to the end of April there will be 3 groups, but from the 1st May until the middle of September, 5 groups, viz., 3 morning groups and 2 groups preceding them, containing the evening observations. The senders of the direct telegrams at Blacksod Point, Shields, Scilly, and Aberdeen, as well as at Skegness and Portland Bill, would have to be instructed by you accordingly.

The Deutsche Seewarte has already been in communication with the Meteorological Institute at Utrecht in order to get this change also made in the telegrams from Valencia, Holyhead, and Wick. A difficulty is hardly to be expected with regard to the addition of the third morning group, and of the two evening groups during the time specified.

As no mention is made in your letter of the cost of forwarding the telegrams, early intimation is requested respecting the conditions under which the new separate telegrams are to be received, also whether any change will be made in the arrangements for the existing separate telegrams, in connexion with your adoption of 7h. a.m. reports for the purpose of weather prediction. In the event of there being no expenses beyond the usual telegraph charges, the Deutsche Seewarte would attach great value to the receipt of separate telegrams from Roche's Point, otherwise the observations from that station would disappear from the weather reports of the Seewarte.

As these latter observations are forwarded to other places, and arrangements would have to be made with the recipients, early information is requested both as to when Skegness and Portland Bill, together with the other stations, will begin reporting in the desired form, and as to the prospects of obtaining separate telegrams from Roche's Point, so that the necessary steps may be at once taken, and especially that proposals may be made to the Imperial Post Office with respect to the telegrams from Roche's Point.

HERZ.

M.O. 224.

Meteorological Office,
February, 1904.

GENTLEMEN,

WITH reference to your letter of 22nd January, and other correspondence relating to the extension of the service of telegraphic reports of observations at 7 a.m., I am directed by the Meteorological Council to inform you that the arrangements are now completed so far as it is within the power of the Council.

The Council note that you desire the telegrams to be sent separately from the several observing stations and the Council will comply with your wishes in this respect as far as may be practicable. But they reserve the right to direct that the telegrams be forwarded in the first instance to London in case the Council think it necessary for the proper supervision of the service or desirable in the general interests of the Meteorological Office.

I am further to point out that while the observations for the official service of the Meteorological Office remain at 8 a.m. the Council cannot supply observations of rainfall at 7 a.m. from their own observing stations, and I have therefore to suggest that sea disturbance should be included in the third group instead of rainfall. The rainfall values for the series of stations might be sent on in a collective telegram after the 8 a.m. observations, as is done at the present time for the Meteorological Institute of the Netherlands.

I have already explained in my letter of 24th February, 1903, that the Council think it desirable to replace Blacksod Point by Malin Head for the immediate future, and they will proceed to carry out that exchange as soon as arrangements can be made.

No arrangements have yet been made with Roche's Point, but the payment to the observer would not exceed £8 a year.

In order to make the proposals clear I have drawn up a statement of the present arrangements and the proposed arrangement for telegraphic reports to the Seewarte, and upon hearing from you that the proposed arrangement meets with your approval, the revised service can be commenced. I have mentioned the first of March as a suitable date for commencement.

I am, &c.,
W. N. SHAW,
Secretary.

An die Direction
der Deutschen Seewarte,
Hamburg.

DEUTSCHE SEEWARTE.

A.—Table showing the present arrangement with the Meteorological Office for the despatch by telegraph of weather reports at stations in the United Kingdom, and the charges for which account is rendered to the Seewarte in addition to the ordinary costs of telegraphy.

WINTER SERVICE—September 16th to April 30th (inclusive).

Morning.

7 a.m. Observations.

Stations.	Contents of Message.	Charges for which account is rendered to the Seewarte.
Stornoway	Groups 1, 2	£8 per annum to observer.
Blacksod Point	Do.	£8 per annum to observer, 14s. per week to Post Office.
North Shields	Do.	£8 per annum to observer.
Scilly	Do.	£8 per annum to observer, 2s. per week to Post Office.
Aberdeen	Groups 1, 2, and 3 with sea disturbance in lieu of rainfall.	Nil.

These reports are sent direct from the individual stations to the Seewarte.

Morning—continued.

8 a.m. Observations.

Stations.	Contents of Message.	—
Dunrossness	Groups 3, 4, 5 of the international code	A charge of 2*s.* a week is made for compilation of telegrams sent from Central Telegraph Office (including 8 a.m., 2 p.m., and 6 p.m. Reports).
North Shields	Do. do. do.	
Blacksod Point	Do. do. do.	
Holyhead	Do. do. do.	
Scilly	Do. do. do.	
Portland	Do. do. do.	
Aberdeen	Do. do. do.	
Roche's Point	Do. do. do.	

A collective message is despatched from the Central Telegraph Office at 8.30 a.m. Late reports are sent on every quarter hour until complete.

Afternoon.

2 p.m. Observations.

Stations.	Contents of Message.	—
Stornoway	Groups 1, 2.	
North Shields	Do.	
Valencia	Do.	

Each report is sent from the Central Telegraph Office as received.

Evening.

6 p.m. Observations.

Stations.	Contents of Message.	—
Valencia	Two groups	Collective telegram is sent as soon as complete, provided it is not later than 8 p.m. Later reports are to be sent on up to 8.30 p.m.
Stornoway	Do.	
North Shields	Do.	
Yarmouth	Do.	
Scilly	Do.	
Blacksod Point	Do.	
Holyhead	Do.	

SUMMER SERVICE.

Morning Reports.

7 a.m. Observations as in the Winter Service.

8 a.m. Observations.

Stations.	Contents of Message.	—
North Shields	Groups 1–5 of the international code.	
Blacksod Point	Do. do. do.	
Holyhead	Do. do. do.	
Scilly	Do. do. do.	
Dunrossness	Groups 3, 4, and 5.	
Portland	Do.	
Aberdeen	Do.	
Roche's Point	Do.	

Afternoon Reports.—As in Winter.

Evening Reports.—Discontinued from May 1st to September 15th.

The reports entered in the list of "times of arrival" forwarded monthly, in accordance with the suggestion of the International Meteorological Committee, include notes of arrival of 7 a.m. reports from Wick, Valencia, and Holyhead, also of a "II. Depesche." The arrangement of the Office with the Seewarte does not include provision for the transmission of these reports.

B.—Tables showing proposed arrangement with the Meteorological Office for the despatch by telegraph of weather reports at stations in the United Kingdom, and the charges for which account will be rendered to the Seewarte in addition to ordinary cost of telegraphy, from March 1st, 1904, or as soon thereafter as any outstanding arrangement can be completed.

Winter Service.

Morning.

7 a.m. Observations.

Stations.	Contents of Message.	Charges of which account will be rendered to the Seewarte in addition to the ordinary costs of telegraphy.
Stornoway	Groups 1, 2, and 3 with sea disturbance in lieu of rainfall.	£8 per annum to observer.
Malin Head (instead of Blacksod Point).	Do. do. do.	£2 12*s.* per annum to observer.
North Shields	Do. do. do.	£8 per annum to observer.
Scilly	Do. do. do.	£8 per annum to observer, 2*s.* per week to Post Office.
Portland Bill	Do. do. do.	£2 12*s.* per annum to observer, 4*s.* 4*d.* per week to Post Office.
Aberdeen	Do. do. do.	Nil.
Roche's Point	Do. do. do.	The remuneration for the observer has not yet been fixed, 7*s.* per week to Post Office.
Skegness	Groups 1, 2, and 3	£6 10*s.* to £10 per annum to observer, £2 17*s.* to Post Office.

The observations are to be reported by separate telegrams to the Seewarte, unless the Meteorological Council deem it necessary for the proper supervision of the service or for any other reason, to have the telegrams sent first to London.

Afternoon.

2 p.m. Observations.

Stations.	Contents of Message.	——
Stornoway	... ...	Each report is to be sent from the Central Telegraph Office as received.
North Shields	... ...	
Valencia	... ...	

Evening.

6 p.m. Observations.

Stations.	Contents of Message.	——
Valencia	Two groups	Collective telegram to be sent as soon as complete, provided it is not later than 8 p.m. Later reports are to be sent on up to 8.30 p.m. A charge will be payable for compilation of reports at the Central Telegraph Office.
Stornoway	Do.	
North Shields	Do.	
Yarmouth	Do.	
Scilly	Do.	
Blacksod Point	Do.	
Holyhead	Do.	

Summer Service.

Morning.

7 a.m. Observations.

Stations.	Contents of Message.	——
Stornoway	Groups 1-5 of the international code with sea disturbance substituted for rainfall.	As in the Winter Service.
Malin Head (instead of Blacksod Point).		
North Shields		
Scilly		
Portland Bill		
Aberdeen		
Roche's Point		
Skegness		

Afternoon.

2 p.m. Observations as in Winter Service.

Evening.

6 p.m. Observations discontinued from May 1st to September 15th.

Approved.

858. *Daily Charts and Charts for the Indian Ocean* (Minutes 839, 805 (ii.), and 842).—Read—a draft letter to the Meteorological Reporter to the Government of India referring to the daily charts for the Indian Ocean, proposed by the Indian Department, and the monthly charts suggested for issue by the Office.

The draft was approved on the understanding that certain modifications would be introduced by the Secretary in consultation with the Hydrographer.

859. *Publications—Continuation of Rainfall Tables* (Minute 844).—The Secretary was directed to consult Dr. H. R. Mill, of the British Rainfall Organisation, as to the terms upon which an arrangement might be made for his undertaking to edit a continuation of the Rainfall Tables to include the years 1891 to 1900.

860. —— *Presentation Copies.*—Reported—that the Observatory of the University of Malta had been placed in the list for presentation copies of the Pilot Charts of the Atlantic and Mediterranean at the request of the Curator, Mr. Cyril Leach (M.O. 249).

Approved.

861. *Instruments for Stations.*—The Secretary was authorised to order sets of sunshine recorders and raingauges at the reduced prices quoted in M.O. 277.

862. *Units of Measurement in Meteorological Observations.*—The consideration of a memorandum drawn up by the Secretary at the request of a Committee of the Council of the British Association as a basis for the discussion of the suggested assimilation of units for Meteorological publications was deferred.

863. *Land Stations.*—The Secretary reported that he had received the offer of observations from a Normal Climatological Station at Whitby in connexion with the Literary and Philosophical Society (M.O. 360), also, from the Borough Engineer, of tracings of four self-recording raingauges in the borough of Camberwell (M.O. 373).

It was agreed to accept the offers with thanks.

The Secretary reported also that, at the suggestion of Mr. E. Mawley, he had written to ask for observations at a new station established by the Royal Horticultural Society at their gardens at Wisley, near Weybridge, and in case the request was complied with that he proposed to include the observations in the Weekly Weather Report.

Approved.

864. *Logs.*—Six received, none excellent. Two abbreviated logs.

865. *Storm Warnings* :—

Signals hoisted on 7 days, total number of districts warned, 42.

In 25 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 17 districts by subsequent strong winds (force 7 or 6).

Gales experienced, for which no Warnings were issued.—None.

866. *Office Staff.*—Resolved—that the tenure of Mr. J. S. Harding's appointment be specially extended to 31st March, 1906 (*See* Minute 4 of 11th April, 1900).

867. *Accounts*—Submitted—The following statement :—

	£	s.	d.
Cash balance on 26th January	6,039	5	6
Receipts from 27th January to 9th February ...	27	12	1
	6,066	17	7
Cheques drawn from 27th Jan. to 9th Feb. ...	876	15	7
Cash balance on 9th February	£5,190	2	0

868. *Reports of Work* for January were submitted and approved.

869. *Library.*—A list of publications received since last meeting was laid on the table.

63, *Victoria Street, S.W., 24th February*, 1904.

PRESENT :

PROFESSOR DARWIN, IN THE CHAIR.

THE HYDROGRAPHER. | MR. SHAW (*Secretary*).

870. The Minutes (855–869) of the last meeting, 10th February, were read and confirmed.

871. *Publications*, O. 123, Minute 839.—Upon the report of the Hydrographer, it was resolved that arrangements be made for a re-issue of O. 123, through H.M. Stationery Office, to consist of 500 copies, in addition to the number (if any) required by the Admiralty.

872. *Publications : Official Copies.*—(i.) O. 71. Reported—That the stock in the Office of the four parts of Official 71, Synchronous Weather Charts of the North Atlantic, 1886, price 17*s.* each part, was as follows : Part 1, none ; Part 2, 1 copy ; Part 3, 45 copies ; and Part 4, 40 copies ; that 650 copies had been printed originally and 500 supplied to the Office ; that in June last the stock at the Stationery Office was 134 of each part, and that the Marine Superintendent desired a further supply of Official copies for presentation to observers.

Consideration was deferred.

—— —— —— (ii.) *Monthly Weather Report.* — Submitted — A proof of the January number of the Monthly Weather Report, with summaries of observations from 25 additional stations (*see* Minute 843).

Approved. Authority was given to increase the monthly official supply by 25 copies for presentation to the observers.

873. *Daily Charts and Pilot Charts for the Indian Ocean* (Minutes 805 (ii.), 821, 842, 858).—Submitted—The following letter, sent to the Meteorological Reporter after consultation with the Hydrographer (Minute 858), to cover the specimen Pilot Chart and the accompanying memorandum by the Marine Superintendent.

M.O. 225.

Enclosure.

Meteorological Office,
23rd February, 1904.

SIR,

YOUR letter of 31st December, 1903, respecting the contemplated publication of Daily Weather Maps for the Indian Ocean and adjacent land areas by your Office, was received when I was on the point of addressing to you a communication with regard to a suggestion made to the Meteorological Council for the issue from this Office of Monthly Pilot Charts of the Indian Ocean, similar to those now published for the North Atlantic. The two subjects are closely related to one another, and I am directed by the Council to refer to both of them in this letter.

2. As regards daily maps contemplated by the Indian Government, I am to say that the Council will gladly render any assistance in their power for their preparation. A chart of the Indian Ocean, forwarded herewith, shows the routes taken by steamers which keep full meteorological logs for this Office. From these sources about six daily observations would probably be available, including about 250 observations per annum, for the high pressure area between Australia and the Cape. I presume that your charts would show observations at a single hour each day, and the Council are of opinion that the simplest plan would be for the data for whatever hour you select, to be extracted from the logs as soon as they have been examined here, and a copy forwarded to you.

3. If, as is probable, it were found necessary to make a charge for the cost of transcribing the data, any such charge would be fixed so as to cover departmental expenses actually incurred for the service.

4. In addition to the data referred to in paragraph 2, the Council already receive occasional returns of daily observations of pressure, sea and air temperature, wind, weather, and sea, from ships (other than the regular liners) made at 8 a.m. and 8 p.m. with their own instruments, entered on a special form and posted as soon as the vessels reach a port from which mails are despatched to England. This form, which is known in the Office as Form 51, is largely used for the collection of observations from the North Atlantic in connection with the issue of Pilot Charts by this Office for that Ocean. If a similar system were adopted by this Office for collecting data from the Indian Ocean the same plan would be followed, and it is estimated that the Council might obtain 90 forms per month, giving three additional sets of daily observations for the ocean area of your maps.

5. Passing to the suggestion for the issue of monthly pilot charts for the Indian Ocean by this Office, which has been put before the Council by Captain Hepworth, our Marine Superintendent, I am to state that he has drawn up a specimen chart and a memorandum, explaining the manner in which the chart has been compiled and the kind of information which would probably be included in the monthly issues. Pending the discussion of observations already collected for the more southern latitudes, the extent of the chart might be curtailed with advantage. In other respects the information which it is proposed to embody appears to the Council to be appropriate.

6. The object in view in issuing such charts would be to stimulate the study of meteorology in its application to navigation, by rendering the information already compiled in various publications available for sailors in a convenient form and at a low price, and by supplementing it with notes and meteorological data derived from the latest available sources.

7. As you remark, there are many vessels crossing the Indian Ocean on the Australian and China routes, possibly exceeding in number those calling at Indian ports. For these, the issue of the suggested charts could certainly be more conveniently undertaken by this Office than by the Indian department, and the materials for their preparation here could also be more completely and speedily collected and arranged. At the same time the Council do not wish to enter upon the preparation of the proposed charts without first informing you, in case you have any views on the subject.

8. They are of opinion that charts prepared and issued through the co-operation of the two departments would be much more likely fully to attain their object, which is of common interest to both Offices, than publications which deal separately with the information collected by the two departments.

9. I am accordingly to inquire how far you would be able to assist in such an undertaking by collecting at Indian ports, with the aid of the marine organisation of your department, and forwarding to this Office, in some manner that would be subsequently arranged, any information that would be of assistance, by making any suggestions now, and from time to time, with regard to the charts, and generally by taking an interest in the undertaking and promoting its success.

10. I presume you are in communication with Mauritius about the proposed daily charts. Some correspondence passed between Mr. Claxton and the Office in 1899-1900 with reference to the compilation of daily charts of the South Indian Ocean from material collected at the Royal Alfred Observatory. Mr. Claxton would probably welcome the proposal now put forward.

I am, &c.,
W. N SHAW,
Secretary.

The Meteorological Reporter to the Government
of India and Director-General of Indian Observatories,
Alipore (Bengal).

MEMORANDUM BY THE MARINE SUPERINTENDENT.

On a Specimen Copy for a Proposed Monthly Pilot Chart of the Indian Ocean.

There seems reason to believe that the issue of a Monthly Pilot Chart of the North Indian Ocean —somewhat on the lines of the Monthly Pilot Chart of the North Atlantic and Mediterranean, issued by the Meteorological Council—would be appreciated by Captains and Officers of the British Mercantile Marine, and would be of practical service to shipping.

The preparation of data for Monthly Wind Charts of the Indian Ocean extending to 30° S., in accordance with the Minute of Council of 3rd July, 1901, is proceeding, and it is expected that the material for the region extending as far south as the Equator, will be ready for incorporation as required in the Monthly Charts; it will be completed by about March, 1905. A specimen copy of a chart has been drafted in order to show the possibilities of the undertaking.

In selecting a month for representation, that of May was chosen so as to show the progress westward of the South-west Monsoon, and its influence upon the circulation of the sea surface.

Until the work in the Office upon the proposed Monthly wind charts is sufficiently advanced to provide material for the region south of the Equator, it will be desirable to limit the area of the charts to the region north of the Equator, but as soon as the data are available, in order to exhibit the seasonal changes more comprehensively it is proposed to extend the limits of the chart to the 15th parallel of south latitude, and the specimen chart is accordingly set out for that area; it is intended to include the Red Sea.

In the specimen chart, in order to indicate the scope of the proposed charts, diagrams indicating the mean quarterly direction and force of the wind, and percentage of calms, are adapted from "Mer des Indes—Cartes de la Direction et de l'Intensité probables des Vents," by Lieutenant L. Brault, of the French Navy; published by the Dépôt des Cartes et Plans de la Marine, of France in 1880; with the exception of those shown over the Bay of Bengal, which are from means recently obtained in the Meteorological Office.

Brault's are quarterly charts, and the values given for May (a critical month) are a generalization of the three months—April, May, and June; the wind diagrams do not show with sufficient accuracy the changes in progress during May. By the end of this year, however, wind diagrams for all months, constructed from Meteorological Office data, should be available for the whole of the sea area north of the line. The currents shown are from M.O. Official No. 124:—"Monthly Current Charts for the Indian Ocean"; and the inset, showing in greater detail, currents in conjunction with sea surface temperature in the neighbourhood of Cape Guardafui and Ras Hafun, is a modified reproduction of M.O. Official No. 92. As regards the Red Sea, the figures illustrating wind and current values are reduced from M.O. Official No. 106—"Meteorological Charts of the Red Sea."

Mean Isobars, and Mean Air and Sea Isotherms for the month, shown on another inset, are derived as follows:—Pressure from M.O. Official No. 76—"Charts showing the Mean Barometric Pressure over the Atlantic, Indian and Pacific Oceans"; also from "Weather Charts for the Arabian Sea, and the Adjacent Portion of the North Indian Ocean": and "Weather Charts for the Bay of Bengal, and the Adjacent Portions of the North Indian Ocean," both published by the Meteorological Department for the Government of India, and drawn up from data furnished by the Meteorological Council.

Air Isotherms from the "Voyage of the Challenger"; and Sea Isotherms from M.O. Official No. 59—"Charts showing the Surface Temperature over the Atlantic, Indian and Pacific Oceans." In drawing the lines of Equal Magnetic Variation, the last Variation Chart published by the Hydrographic Office (1892, with large corrections to 1900) has been utilized. It is proposed to indicate, month by month, the northern limits of the South-east Trades, to show the paths of some notable cyclonic storms which have occurred in recent times; and to project tracks recommended for sailing vessels, and for steamers on the principal Trades Routes; adding remarks upon the same.

Space is reserved on the face of the Chart, and will be available also on the back for Notes on Winds and Currents in the Arabian Sea and Bay of Bengal; and for *Recent Information*, which might be given in red letters.

Storm warnings used during the daytime, and also those in use during the night are given on the back of the Chart.

C. H.

The Secretary,
Meteorological Council.

874. *International Conferences:* (i.) *Geographic.*—Submitted—An invitation to the Eighth International Geographic Congress at Washington in September, 1904.

—— —— (ii.) The following notice of a Meteorological Conference at Innsbrück in 1905.

COMITÉ MÉTÉOROLOGIQUE INTERNATIONAL.

MONSIEUR ET TRÈS HONORÉ COLLÈGUE,

LE Comité météorologique international, dans sa dernière réunion à Southport en septembre 1903, a émis un avis favorable, sur la proposition de M. Pernter, à la convocation d'une Conférence générale des Directeurs à Inspruck (Autriche) dans la *deuxième semaine de septembre* 1905.

Cette conférence aurait le même caractère que celles de Rome en 1879, de Munich en 1891 et de Paris en 1896.

Nous avons l'honneur de vous prier de vouloir bien nous communiquer votre avis sur ce projet, en indiquant les questions sur lesquelles vous auriez à proposer qu'une discussion ait lieu dans la Conférence.

Dans ce cas, il est désirable que les personnes qui proposent une question pour la délibération de la Conférence distribuent avant la réunion un petit Rapport imprimé sur cette question.

Prier d'adresser les réponses le plus tôt possible au Secrétaire du Comité international.

Agréez, Monsieur, l'assurance de notre plus haute considération.

Paris et Upsal en Février 1904.

Le Président, E. MASCART. Le Secrétaire, H. H. HILDEBRANDSSON.

875. *International Telegraphic Service* (738, 789, 857.)—(i.) Read—The following letter :—

M.O. 452.

PROPOSED MODIFICATIONS OF WEATHER TELEGRAMS.

Koninklijk Nederlandsch
Meteorologisch Instituut,
de Bilt 16 February, 1904.

DEAR SIR,

BY an intelligence of the "Deutsche Seewarte," I have been informed as to the modifications which are to be introduced in the list of British weather telegrams for Hamburg.

The Deutsche Seewarte also bade this Institution to lay proposals before the Meteorological Office for extending adequately the morning telegrams sent to Holland.

As, by your new regulations with Hamburg, simplification and, at the same time, improvement to a considerable amount of our mutual weather service seems to have become practicable, I beg at once to propose the following modifications in this service :—

(*a*) To extend the 7h. morning reports of Cahirciveen and Holyhead by the third usual group T' T' R R R ;

(*b*) To add a quite similar 7h. morning report of Dunrossness (or Sumburghhead) ;

(*c*) To stop the morning report of Wick and the 8h. morning report of Oxford and Dunrossness, with its 18 additional rain numbers ;

(*d*) To add to the 6h. evening telegram two groups relating to Dunrossness (Sumburghhead).

I should feel very much obliged if you would, without much delay, lay these proposals before the Meteorological Council, and am very anxious for your answer and for any information as to the expense, which will be due for the new telegrams.

In the meantime,

I am, &c.,
C. H. WIND.

To the Secretary of the
Meteorological Office, London.

The Secretary reported that he had sent a reply (P.C. 570) in the same terms as the letter to the Seewarte (Minute 857).

Approved.

—— —— -—— (ii.) Read—A letter (M.O. 462) from the observer at Roche's Point, declining to undertake the duty of reporting at 7 a.m.

The Secretary was directed to make inquiries as to possible stations on the South Coast of Ireland.

876. *Antarctic Expeditions* (567, 623, 737, 758, 846).—Read—The following letter (P.C. 542) sent to the Royal Society, after consultation with the Chairman, in accordance with Minute 846 :—

M.O. 2,683.

Meteorological Office,
17th February, 1904.

SIR,

WITH reference to your suggestion that the Meteorological Council should undertake the tabulation and preliminary discussion of the Antarctic observations, if the Royal Society obtains a guarantee for the repayment of expenses to the extent of £500, I am directed by the Council to say that while they cannot accept responsibility for the preparation for publication of the results of the Antarctic Expeditions, which must rest with the Royal Society and the Royal Geographical Society, they are willing to do all that is in their power to facilitate the carrying out of the object in view.

2. The work for which apparently it is necessary to provide is as follows :—

(*a*) The arrangement of the plan upon which the meteorological observations, including those of the "Discovery," and the auxiliary observations on land and sea, shall be reduced, tabulated, and plotted for publication; the supervision of the tabulation; the preparation of a report upon the observations to form a preliminary discussion.

(*b*) The tabulation of auxiliary observations to form material for synoptic charts for each day of the two and a-half years, 1st October, 1901, to 31st March, 1904, for communication to the German authorities as desired by the German Ambassador, and the preparation of charts incorporating the observations.

(*c*) The examination and tabulation of the "Discovery's" observations in form suitable for publication.

The work indicated under (*a*) necessarily involves some novel features, and must be placed in the hands of some competent person who is able to devote time to the consideration of details, and who can take into account the bearings of the observations on general meteorological research. Allowing a sum of £100 as remuneration for the work under this head, I estimate the cost of the clerical work necessary to carry out the rest of the programme at £400, making in all £500 for the whole of the work indicated.

It must be understood that in mentioning the sum of £500, I am referring only to the provision for work which can be outlined from the information at present available.

3. The staff of this Office in each department is already fully occupied with work that cannot be postponed or set aside, and the work upon the Antarctic observations could only be undertaken if additional provision is made for the clerical work and the detailed supervision.

4. It is understood that the magnetic observations will be dealt with by the Admiralty, and immediate provision is urgently necessary for the meteorological observations. The question was raised by the Secretary of State for Foreign Affairs as long ago as 9th February, 1903, by a letter forwarding a note from the German Embassy, asking for a copy of the tabulations of the auxiliary observations. No one is yet in a position to comply with the request of the German Embassy.

5. If the President and Council desire it, I should be prepared to put before the Meteorological Council a proposal that they should undertake forthwith the work indicated, provided the repayment of expenses to the extent of £500 is guaranteed.

6. The Council would, I think, require to have it made clear that if they undertook the work the observations and records of the "Discovery" should be handed over to them for the purpose, and that no preliminary partial publication of the results should take place.

The preliminary work must be considerably advanced before it is possible to decide upon the form most suitable for publication or to make an estimate of the cost involved therein. When an estimate can be formed it will be necessary for the Societies to ascertain how the cost of publication should be met.

I am, &c.,

W. N. SHAW,
Secretary.

Professor J. Larmor, F.R.S.,
Secretary of the Royal Society,
Burlington House, W.

877. *Colonial Observations: St. Helena Anemograph* (Minute 777).—Submitted—Specimens of wind roses for January and July prepared from six years' tabulations of the anemograms, reduced to eight points only of the compass in consequence of the unsatisfactory nature of the direction traces from the commencement of the records.

(i.) It was resolved to proceed with the grouping of the observations on similar lines.

(ii.) The Hydrographer was requested to ascertain whether any officer of the Royal Engineers or Royal Navy able to give assistance in getting the instrument properly adjusted was at St. Helena, or likely to be there.

878. *Colonial and Foreign Observations: Ocean Island* (Minutes 807, 845 (i.).—It was agreed to supply to the representative of the Pacific Islands Company, at Ocean Island, a set of instruments for a normal station, together with a self-recording barograph.

879. *Units of Measurement in Meteorological Observations* (Minute 862).—The Secretary was authorised to inform the Committee of Council of the British Association that the Council are of opinion that the proposals contained in the memorandum drawn up by the Secretary provide a satisfactory basis for the discussion of the assimilation of units for meteorological publications.

880. *Forecasts* for January, 1904 :—

The letters used have the following signification :
a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	45	74	60	96
"	b	49	23	36	
"	c	3	0	1	
"	d	3	3	3	
Scotland, E.	a	65	74	70	94
"	b	26	23	24	
"	c	9	3	6	
"	d	0	0	0	
England, N.E.	a	68	77	73	97
"	b	26	23	24	
"	c	6	0	3	
"	d	0	0	0	
England, E.	a	61	71	66	95
"	b	32	26	29	
"	c	7	3	5	
"	d	0	0	0	
Midland Counties	a	39	68	54	89
"	b	42	29	35	
"	c	16	3	10	
"	d	3	0	1	
England, S.	a	61	71	66	92
"	b	29	23	26	
"	c	7	6	7	
"	d	3	0	1	
Scotland, W.	a	55	74	65	96
"	b	36	26	31	
"	c	3	0	1	
"	d	6	0	3	
England, N.W.	a	49	74	62	86
"	b	32	16	24	
"	c	19	7	13	
"	d	0	3	1	
England, S.W.	a	45	68	57	86
"	b	36	23	29	
"	c	19	6	13	
"	d	0	3	1	
Ireland, N.	a	26	78	52	88
"	b	55	16	36	
"	c	19	6	12	
"	d	0	0	0	
Ireland, S.	a	45	61	53	76
"	b	23	23	23	
"	c	29	13	21	
"	d	3	3	3	
Summary					
British Islands	a	51	72	62	91
"	b	35	23	29	
"	c	12	4	8	
"	d	2	1	1	

881. *Accounts.*—Submitted—The following Statement of Accounts for the nine months ending 31st December, 1903 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1902–1903	—	1,776 2 5	ADMINISTRATION:		
Proportion of vote ...	—	10,500 0 0	Secretary	450 0 0	
Repayment of expenses charged under—			Salaries and wages ...	811 13 6	
(1.) Incidental expenses	9 3 7		Rent, fuel, and lighting	529 7 11	
(2.) Observatories ...	24 6 8		Incidental and contingent expenses ...	253 13 7	
		33 10 3	Furniture and fittings	62 15 3	
SUPPLY OF INFORMATION:			Expenses incidental to International Meteorological Congress ...	81 14 3	
Weather Forecasts, Reports, &c. ...	451 18 3				2,189 4 6
Telegrams sent abroad	522 18 8		SPECIAL RESEARCHES: Salaries and other charges	—	637 2 5
		974 16 11	LAND METEOROLOGY: Observatories and stations, including remuneration of observers	1,693 16 6	
SUPPLY OF INSTRUMENTS, &c.:			Salaries :— Discussion and reduction of observations, &c. ...	1,361 10 6	
Repayment of cost of M.O. instruments purchased by observers	102 19 2				3,055 7 0
Repayment of cost of other commissions...	282 12 0		WEATHER INFORMATION AND FORECASTS: Telegraphic reports and storm warnings, remuneration of observers, &c.	1,832 13 10	
		385 11 2	Salaries:—Preparation and issue of reports and forecasts ...	1,051 12 10	
CHARGES FOR COMMISSION:					2,884 6 8
On supply of instruments, &c.	—	14 6 3	INSPECTIONS: Salaries and travelling expenses	—	353 10 5
SUPERANNUATION ACCOUNT:			OCEAN METEOROLOGY:		
Annuity	178 5 10		Salaries :—Discussion and reduction of observations... ...	1,039 1 0	
Interest on Investment	24 16 0		Expenses incidental to the supply of instruments :—		
		203 1 10	Proportion for care and issue of instruments	105 0 0	
			Royal Navy ...	199 15 2	
			Mercantile Marine	348 12 9	
			Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	1,692 8 11
					273 18 7
			SUPERANNUATION: Pensions and allowances	622 1 4	
			Invested	750 0 0	
					1,372 1 4
			BALANCE: Cash at Bank	1,383 18 3	
			„ at Office ...	45 10 9	
					1,429 9 0
		£13,887 8 10			£13,887 8 10

Liabilities.	£ s. d.	Assets.	£ s. d.
To sundry creditors	1,554 8 1	By cash at Bank and at Office ...	1,129 9 0
„ balance	1,250 8 0	„ H.M. Exchequer	975 0 0
		„ sundry debtors	400 7 1
	£2,804 16 1		£2,804 16 1

NOTE.—On December 31st the amount of 2½ per cent. Annuities held by the Council for the provision of Superannuation Annuities was £1,326 7*s.* 8*d.*

882. *Instructions for keeping the Meteorological Log* (Minute 792).—Read—The following memorandum :—

It is suggested as advantageous that in future Registers, or a series of Registers containing three, instead of four months consecutive observations constitute an "excellent log." Observers on board sailing vessels unfortunately are few. The average voyage of a steamer at present occupies considerably under four months. Most logs are now made use of for supplying recent information in connexion with the Pilot Charts, &c., immediately upon their receipt, as well as at any period subsequently for the principal work of the Branch. Logs ruled for a three months' voyage would be a convenience.

C. H.

Approved.

883. *Logs.*—Five received, one excellent—Captain J. D. S. Phillips ; one abbreviated log, five lighthouse registers.

884. *Forecasts.*—Read—M.O. 465 from Captain Bacon asking for forecasts for H.M.S. Thames.

The Secretary was directed to say that application should be made through the Admiralty, and was authorised to send forecasts on the present application in this instance.

885. *Storm Warnings:*—

Warnings were issued on 8 days ; the total number of districts warned being 68.
In 34 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 16 districts by subsequent strong winds (force 7 or 6). In 18 districts the warnings were not required.

Gales experienced without Warning.—None.

886. *Accounts.*—Submitted—The following statement :—

	£	s.	d.
Cash balance on 9th February	5,190	2	0
Receipts from 10th to 23rd February	14	19	4
	5,205	1	4
Cheques drawn from 10th to 23rd February ...	340	17	1
Cash balance on 23rd February	£4,864	4	3

887. *Library.*—A list of publications received since the last meeting was laid on the table.

63, *Victoria Street, S.W., 9th March*, 1904.

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	THE HYDROGRAPHER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

888. The Minutes (870-887) of the last meeting (24th February) were read and confirmed.

889. *International Telegraphic Service* (857).—Read—The following letter:—

M.O. 526. (Translation.)

Deutsche Seewarte, Hamburg,
26th February, 1904.

IN reply to your very obliging letters of the 13th and 20th inst. (M.O. 224), the Deutsche Seewarte informs the Meteorological Office that its statement of arrangements for future weather telegrams from the British Islands, with the exception of the communication of sea-disturbance, corresponds to its wishes. The Imperial Post Office has been informed by the Imperial Admiralty that the omission of the collective morning telegrams and the commencement of the important new system will date from 1st March. The General Post Office will no doubt receive timely intimation of the change in the telegraphic weather service, so that it may begin at the time stated.

The Deutsche Seewarte deeply regrets that it will not be possible at present to receive the rainfall values, as desired, in the early telegrams. Its intention is to include the rainfall in the weather telegrams sent from Hamburg to subscribers, and for this purpose the subsequent notification of rainfall in collective telegrams cannot be taken into consideration.

But in order not to delay the introduction of the telegraphic weather service in the new form which has been so long desired, the Deutsche Seewarte has decided to be satisfied with the sea-disturbance in the third group of the morning observations, for the present, instead of the more valuable rainfall, in the confident expectation that it will at no distant time see it's wish fulfilled with respect to the communication of the rainfall in the early telegrams.

The proposal relating to the transmission of direct early telegrams from Roche's Point has also been reported to the Authorities, but the sum to be allowed these telegrams, in accordance with your letter of the 20th inst., will depend chiefly on the success of your further kind exertions.

At all events, the Deutsche Seewarte takes this opportunity of expressing its sincere thanks to the Meteorological Office for its strenuous exertions, which have succeeded in almost completely meeting the desires of the Seewarte with respect to the weather telegrams from the British Islands.

(Signed) KOLDEWEY.

To the Meteorological Office,
London.

890. *Meteorological Conference at Innsbrück*, 1905 (874).—The Secretary was directed to inform the Secretary of the International Committee, in reply to the circular (874) that a meeting of the British Association was to be held in South Africa in the summer of 1905, but that if the replies to the circular showed a general approval of the proposal for a conference at Innsbrück, the Council would endeavour to send a representative.

891. *Antarctic Expeditions* (876).—Read—The following letter and a draft reply:—

M.O. 564.

Burlington House,
London, W.,
1st March, 1904.

SIR,

WE have been directed to express the thanks of the President and Council of the Royal Society for your letter of 17th February, stating the conditions upon which the Meteorological Council would undertake the tabulation and reduction of the Meteorological Observations made in connexion with the National Antarctic Expedition. They understand that you make a provisional estimate of £100 as remuneration for expert scientific work and £400 for clerical work, and that the Meteorological Council would desire a guarantee in advance for the repayment of their expenses up to this total amount of £500.

The statement in your letter that you are directed by the Meteorological Council to say that "while they cannot accept responsibility for the preparation for publication of the results of the Antarctic Expedition . . . . they are willing to do all in their power to facilitate the carrying out of the object in view," has attracted the attention of the Council of the Royal Society; and we have been instructed to ask for further particulars as to what the Royal Society and the Royal Geographical Society would receive in return for this guarantee in advance up to £500.

The plan that was in the minds of the Royal Society was that the Meteorological Council, being the British official body in charge of such work, and possessing the organization required for its execution, might be willing to undertake the reduction in concert with a consultative expert Committee appointed by the Royal Society; and the Council would like also to be informed whether this plan is, in the judgment of the Meteorological Council, a feasible one.

The Council of the Royal Society also note that your letter points out that it will be a question for the future, on which a decision cannot now be made, how the cost of publication of the results is to be met. It would appear, however, that under the plan which you sketch out, the cost would be a very heavy one; and it seems desirable that this plan should not be finally adopted until some kind of understanding has been arrived at regarding the probability that the results, the preparation of which would involve so large an outlay, would be made available for public use.

We are, &c.,

J. LARMOR,
ARCH. GEIKIE,
Secretaries, R.S.

The Secretary of the
Meteorological Council.

The Secretary was directed to reply, suggesting that he should attend a meeting of the Committee appointed by the Royal Society and furnish, on behalf of the Council, any particulars that may be required for the information of the President and Council.

892. *Scottish Antarctic Expedition.*—Read—The following letter, with memoranda thereupon, by the Hydrographer and Marine Superintendent :—

Lat. 45° 31′ S.
Long. 55° 21′ W.

Antarctic Ship
"Scotia,"
28th January, 1904.

DEAR SIR,

PERMIT me to call your attention to the fact that the Oficina Meteorológica Argentina have, on my suggestion, consented to continue during the coming year the meteorological station set up by the Scottish National Antarctic Expedition last year, and at present being carried on by that Expedition: It is hoped that Mr. R. C. Mossman, at present in charge of the above-mentioned station at Scotia Bay, South Orkneys, will consent to remain in charge. He will be assisted by three Argentine Assistants, who are present guests on board the "Scotia," and by one of the crew of the "Scotia," who will act as cook and steward to the party. I will leave a barograph at Cape Pembroke lighthouse, which I have had there for the past year, and also, I hope with your approval, the sunshine recorder at Government House, in order to give as complete a chain of meteorological records there in connexion with the Scottish-Argentine Station at South Orkneys and the great meteorological organisation of the South of the Argentine Republic. May I also suggest that the British Admiralty should be asked to send special and renewed instructions to their vessels on the South Atlantic Station for the prosecution at least of four-hourly observations, especially during the whole of the present year and, if possible, thereafter. The "Scotia," I may mention, is taking, and will continue to take, hourly observations, and has, besides, recording instruments. These observations are being taken between Buenos Aires and Port Stanley, between Port Stanley and Scotia Bay, and it is hoped, to the south-east, south, east, and north-east of Scotia Bay, possibly (with good fortune) to 70° S. latitude and to Cape Town.

The co-operation, therefore, in this meteorological campaign, of British Men-of-War, and also, indeed, merchant ships, is highly desirable if it can be effected.

I am, &c.,
(Signed) WM. S. BRUCE,
Leader of the Scottish National
Antarctic Expedition.

W. N. Shaw, Esq., F.R.S.,
Meteorological Office, S.W.

Remarks by Hydrographer.

All of H.M. Ships take observations of barometer and thermometer every four hours.

It is very seldom that any of them are south of the Plate, and their isolated observations are not of much value in connexion with South Orkneys, but there they are.

(Signed) W. J. L. WHARTON.
2/3/04.

Remarks by Capt. Hepworth.

During the year ending October, 1902, 19 ships keeping M.O. logs passed over squares 484 to 488 inclusive (see accompanying diagram).

By applying to the New Zealand Shipping Co. and the Shaw, Savill, Co. for their co-operation in this special work, we could, I think, double, or nearly double, that number for the year ending March, 1905.

C. H.

It was agreed that the New Zealand Shipping Co. and the Shaw, Savill, Co. be invited to co-operate by contributing observations as requested by Mr. Bruce.

893. *Kite Observations* (773).—Submitted—The following draft letter with correspondence (M.O. 578) :—

M.O. 578.

Meteorological Office,
3rd March, 1904.

SIR,

I HAVE been in correspondence with Mr. E. W. L. Holt, of the Fisheries Branch of your Department, respecting a suggestion for obtaining meteorological observations by means of kites from time to time from the deck of the s.s. "Helga."

The exploration of the upper air is one of the most promising directions of investigation with a view to determining the distribution of temperature, humidity, &c., under various conditions. Upon such investigations hopes are justly based for the gradual extension of the effectiveness of the practical applications of meteorology, and as the raising of kites from the deck of a steam vessel is the method of pursuing the investigation most suitable for the conditions of these islands, the Meteorological Council are desirous of assisting as far as possible in extending the practice of making observations of this kind in this country.

From the correspondence with Mr. Holt, it would appear that the necessary apparatus could be accommodated on the "Helga," and I am directed to ask whether your Board would be willing to give facilities for the experiments to be made there.

Special apparatus would be required and, with regard thereto, I have been in communication with the Joint Committee of the British Association and the Royal Meteorological Society, which is engaged in conducting meteorological investigations by means of kites. I have ascertained that they would probably be willing to lend the gear and any instruments that are required, and further, that Mr. Dines, who has been conducting experiments for the Committee off the west coast of Scotland, would undertake, at the request of the Council, to instal the apparatus and carry out some ascents therewith, in order that all the details might be made clear.

The Council attach great importance to the investigation of the upper air off the Irish coasts, and they trust that your Board may see their way to forwarding the investigations by sanctioning the trial of experiments on board the "Helga."

I have made no specification of the frequency or duration of the proposed experiments. An ascent on the first Thursday of each month has been represented to the Council as most desirable, for a long time past, and recently through the agency of the Foreign Office, by the German Ambassador, conveying the view of the International Committee for the investigation of the upper air. This view is fully supported by the official organisations of the chief countries of the continent of Europe.

The Council think that the consideration of details as to date and duration of experiments might be more appropriately considered when it has been ascertained whether experiments of the kind suggested could be arranged without interfering with the work upon which the "Helga" is already employed.

I am, &c.,
W. N. SHAW,
Secretary.

The Secretary,
Department of Agriculture and Technical Instruction,
4, Upper Merrion Street, Dublin.

Approved.

894. *Publications: Rainfall Tables* (844, 859).—Submitted—The following draft letter :—

M.O. 424.

Meteorological Office,
7th March, 1904.

DEAR DR. MILL,

REFERRING to my letter of the 15th February and our interview on Thursday last, I am directed by the Meteorological Council to ascertain the terms upon which you would be willing to undertake to edit a continuation of the Council's publication: "Rainfall Tables of the British Islands," 1866-1890.

2. The volume above mentioned, which was published in 1897, gives tables of monthly totals for each of the years 1881-1890 at 492 stations in the British Isles, with averages for lustra, and similar tables for 1866-1880, or for shorter periods for a number of stations included in the 492, but not in the list of a previous publication.

3. The basis upon which your estimate should be formed may be indicated by the following notes :—

(i.) The tables for the years 1891-1900 should give information for 500 stations in the British Isles.

(ii.) For those of the 492 stations of the previous volume, for which returns are available, the information given in the previous volume should be continued. Those of the 492 for which the later returns are not available should be replaced by others as nearly as may be similar in situation, unless the number of stations in the district is already sufficiently representative. In the latter case, a station in some other district should be substituted in order to secure, as far as practicable, a satisfactory distribution of stations over the Kingdom. The eight additional stations required to make up 500 should be selected with the same object in view. The selection of the stations for this purpose would be at your discretion, subject to the approval of the Council.

(iii.) Data for all stations from which the Office receives records would be supplied in form ready for publication, but you would be at liberty to raise any question that suggests itself as to the accuracy of the data. You would be expected to supply the data for the remaining stations if you are able to do so.

If you consider it necessary to apply to any other organisation for additional information, the application should be made through the Council.

(iv.) You would be expected to act as editor of the volume and, in discharge of that duty, to write a short introduction indicating the principles upon which the selection of stations has been made. It would probably be desirable that the index maps, corresponding with those in the previous volume, should carry some indication of the general distribution of mean rainfall for a long period, for the purposes of reference.

(v.) In forming your estimate, it would be desirable to keep separate the charge for supplying the information required and the fee for editing the volume.

4. The Council would be glad to know by what time from its commencement the work could be completed.

5. I am to make it clear that the particulars for which I am now asking are for the information of the Council, and it must be understood that the Council may not find themselves able to take up the work.

I am, &c.,
W. N. SHAW,
Secretary.

Dr. H. R. Mill,
62, Camden Square, N.W.

P.S.—The question has been raised whether some arrangement could be made for part payment in relation to the proceeds of the sale of copies of the volume in contemplation, and in connexion therewith, whether it would not be advantageous to make the tables up to 1905 by the time that year lapses, and so issue a volume much more closely up to date than one dealing with 1900. The Council will be glad of your views upon these points, and upon the additional expense that would be incurred in carrying out the suggestion last mentioned.

W. N. S.

Approved.

895. *Publications*: *Monthly Weather Report*, *Sunshine Records*.—The Secretary pointed out that the monthly summary for January showed considerable incongruity between the stations reporting the sunshine as recorded on the Jordan photographic recorder and the Campbell-Stokes recorder; that corresponding incongruity was shown in the Registrar-General's monthly summaries, and that attention had been called to the matter in several ways in the correspondence (M.O. 23 and 618).

It was resolved that from the end of the current year no observations should be published by the Office except those made with instruments which conformed satisfactorily with those employed by the Council, and that sunshine observations by the Jordan recorder should be no longer included.

896. —— *Colonial Observations*.—Read—The following letter:—

M.O. 739.

6, Elm Park Gardens, S.W.,
25th February.

MY DEAR SHAW,

HANN has written to Wilson Barker, suggesting that the Colonial observations published down to 1886 should be continued till 1900.

It is mainly Bermuda and the stations near the Atlantic anticyclone that he is keen upon. Do you think you could get the original sheets from the R.E. or A.M.D.? I did get them for the former work.

Yours very truly,
ROBERT H. SCOTT.

897. *Stations* (i.) *London*.—Submitted—The following draft letter to the Office of Works:—

Meteorological Office,
10th March, 1904.

SIR,

I BEG leave to bring to your notice a matter that has been engaging the attention of the Meteorological Council.

It is part of the duty of the Council, in the administration of the Parliamentary grant assigned to them, to collect meteorological observations from various parts of the United Kingdom and elsewhere, for the information of the public and the promotion of the practical applications of meteorology.

In this collection of information, the meteorological conditions of the London area are very inadequately represented. The Observatories of Greenwich and Kew are outside the limits of the area in its strictest signification, and within the narrower limit the daily requirements of the Office have been served during upwards of 30 years by a station in a private garden at Brixton, from which observations of pressure, temperature, &c., are reported by telegraph or messenger to the Office, and by reports of sunshine, obtained also from a private establishment.

Observations are also made upon the roof of the building by the staff of the Office, but it is well understood that such an exposure is subject to unavoidable defects.

The prolonged illness of the Observer, who has supplied the telegraphic reports for many years, makes it necessary for the Council to revise the arrangements, and they desire to ask for the assistance of H.M. Office of Works in placing the system of observing and reporting meteorological data for London upon a satisfactory footing.

The primary requirement is the use of a sufficiently open space to give a satisfactory exposure, and the Council suggest that this might be found in one of the parks under the jurisdiction of the Commissioners of Works, without inconvenience or interference with its ordinary uses. The necessary instruments do not occupy much space, and they are not unsightly.

The next most important requirement is accessibility to a telegraph or telephone office, so that the observations may be transmitted directly to this Office.

In order to read the instruments and report to the Office, a member of the staff could be sent from this Office, but it would probably be found more convenient, with the sanction of the Commissioners of Works, to place the instruments in charge of one of the park attendants or one of the gardeners engaged within the parks, and for him to report the observations to the Office.

The Council receive assistance of a similar kind from the Admiralty, who allow the coastguardsmen to undertake the duty, and who prove themselves excellent observers. In such cases the Council make a small annual allowance to the observer.

I have been directed by the Council to mention these points, because they may serve to give a definite idea of the nature of the work for which they seek to make provision. They think, however, that if the Commissioners of Works be disposed to assist the Council in the matter, the details could be more easily settled in a personal interview.

The Council note that the Commissioners themselves provide thermometers at various parts of the parks for the information of the public, and they are encouraged to think that an organised record of meteorological information upon an authoritative basis would not be unwelcome on its own account, apart from the assistance it would render to this Office in the discharge of its duty.

The Council will be greatly obliged if you will bring the matter before H.M. Commissioners.

I am, &c.,

W. N. SHAW,
Secretary.

The Secretary,
H.M. Office of Works,
Storey's Gate, S.W.

Approved.

Stations (ii.) *Camberwell Rain Gauges* (M.O. 506).—Submitted—The following report :—

INSPECTION OF RAIN GAUGES AT CAMBERWELL.

IN accordance with your request that I should see the self-recording rain gauges recently set up in the Borough of Camberwell by the Borough Council, I was invited by the Borough Engineer, Mr. W. Oxtoby, C.E., to visit the sites, which I did to-day (24 February).

1. *The Town Hall Gauge.*—This gauge is placed on the roof of the Town Hall, and records electrically in Mr. Oxtoby's room. The roof is about 40 ft. above the street, and it is much broken up by super-structures ; it is, therefore, by no means a good site for a rain gauge. I do not consider that the record from this instrument will fairly indicate the amount of local rainfall.

(2.) *Camberwell Green Gauge.*—This gauge is about half a mile from the Town Hall, to the west. It is placed at the northern end of the enclosure, in a fairly well exposed position. It is protected by a circular "unclimbable" fence, about 6 ft. in diameter, but I do not consider that either the fence or some low shrubs not far away will prejudice the record of the gauge which, so far as exposure is concerned, ought to be a good one.

(3.) *Leyton Square Gauge.*—This gauge also occupies a satisfactory site. The "Square" is an oblong enclosure, probably 100 yards long by 30 yards wide, surrounded by small houses ; it was once a gravel pit but is now a recreation ground. The gauge is at the southern end of the enclosure and is protected by a fence similar to that used at (2). It cannot be much more than a mile in a direct line east from No. (2), and except for very local falls, such as might occur with thunderstorms, the records from the two gauges should be almost identical.

(4.) *Camberwell Cemetery Gauge.*—The cemetery is in the southern part of the Borough and lies on the northern slope of a long ridge, which runs north-east and south-west, the ground rising rather steeply to the south but falling away less quickly to the north. The gauge stands in an enclosure used by the gardeners at the highest part of the cemetery, and although there are some low forcing houses close at hand, the exposure is a good one and is the best available. There is a railway embankment some 80 yards or so to the south, and higher up the hill, but I do not think it can appreciably affect the rainfall at the gauge. From its position on much higher and sloping ground, a comparison of the record from this gauge with those from Nos. (2) and (3), on level ground rather more than two miles to the north, should be of interest.

It is proposed to set up a fifth gauge, and at the request of the Assistant Engineer (Mr. Slater) I visited two sites, one 2 miles to the south-west of the cemetery, the other 1¼ miles to the west, and advised him as to the best position for the gauge.

I was shown a tin cover, intended to be placed over the gauges for their protection; but as their use could not fail, in my judgment, to prejudice the record, I strongly advised that no cover at all should be used.

One or two discrepancies in the records up to date were pointed out to the Assistant whose duty it is to attend to the gauges.

I append to this report a map of Camberwell (M.O. 506) on which the positions of the gauges are indicated by a red cross.

R. H. CURTIS.

Stations (iii.) *Forest of Dean.*—Reported—The receipt of returns of daily rainfall from six stations, recently established in the Forest of Dean, from Mr. Philip Baylis, of H.M. Commissioners of Woods and Forests. (*See* Minute 768.)

—— (iv.) *Rhayader, Mid Wales.*—Read—The following letter:—

M.O. 535.

City of Birmingham,
Water Department,
44, Broad Street,
29th February, 1904.

PROPOSED CLIMATOLOGICAL STATION, ELAN VALLEY.

DEAR SIR,

REVERTING to my letter of the 4th inst., I have now placed this matter before my Committee, and have obtained their general assent to the proposal for the establishment of a station on the Corporation Watershed in the Elan Valley, subject to satisfactory arrangement of details, and I am instructed to continue the correspondence with you.

I do not think we can proceed furthur until your inspector has been on to the ground. I should like to be present when he is there. I expect to go down to Rhayader on 10th March, and could make an appointment for 11th March if that would be a convenient date.

Will you in the meantime kindly inform me whether our existing rain gauges will suit your purpose. As I told you in mine of the 4th inst., they are all 5″ gauges, with the exception of one (at Nant-y-car), which is a monthly gauge and 12″.

As desired, I enclose a copy of the readings of our gauges for 10 years, 1894–1903 inclusive.

Yours faithfully,
E. HENRY LEES,
Secretary.

W. N. Shaw, Esq., M.A., F.R.S.,
Secretary, Meteorological Office.

The Secretary reported that he had instructed Mr. Lempfert to meet Mr. Lees at Rhayader on March 11.

Approved.

—— (v.) *St. Helena* (877).—The Hydrographer reported that he had written to Major Paske, R.E., at St. Helena, asking him to give assistance with regard to the adjustment of the anemometer.

898. *Instruments: Fishery Barometers.*—Read—M.O. 597 from W. Pearce, Chief Officer H.M. Coastguard, Mullaghmore, Co. Sligo, asking for a fishery barometer for that port.

It was agreed that the barometer be lent after communication with the Irish Board of Agriculture and Technical Instruction.

899. *Instruments—Quarterly Return:—*

RETURN of SERVICEABLE INSTRUMENTS in the OFFICE and at HIS MAJESTY'S DOCKYARDS for the QUARTER ending 31st DECEMBER, 1903.

Place.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available 1st Oct., 1903	66	79	88	42	42	41
	Received, new	—	—	—	30	15	—
	„ cleaned and repaired.	34	55	56	—	—	—
	Total	100	134	144	72	57	41
	Issued	26	55	134	9	9	4
	Total available 1st Jan, 1904.	74	79	10	63	48	37

Return of Admiralty Instruments for the Quarter ending 31st December, 1903.

Depôts.	Barometers.								Thermometers.															
	Mercurial.				Aneroid.				Ordinary.				Maximum.				Minimum.				Screens.			
	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.
Portsmouth	25	20	—	5	55	49	—	6	150	133	—	17	50	56	6	—	50	63	13	—	25	17	—	8
†Devonport	25	18	—	7	55	36	—	19	150	121	—	29	50	36	—	14	50	34	—	16	22	15	—	7
†Chatham	25	21	—	4	55	44	—	11	150	137	—	13	50	49	—	1	50	51	1	—	25	13	—	12
Sheerness	6	6	—	—	15	14	—	1	30	30	—	—	10	9	—	1	10	9	—	1	10	10	—	—
Queenstown	5	4	—	1	10	9	—	1	15	15	—	—	8	7	—	1	8	7	—	1	—	—	—	—
(Dockyards, Home) Totals	86	69	—	17	190	152	—	38	495	436	—	59	168	157	6	17	168	164	14	13	82	55	—	27
Gibraltar	2	3	1	—	2	1	—	1	4	8	4	—	3	3	—	—	3	3	—	—	—	—	—	—
†Malta	11	9	—	2	15	16	1	—	60	52	—	8	10	11	1	—	10	11	1	—	1	—	—	1
†Bombay	4	2	—	2	3	1	—	2	10	0	—	10	4	0	—	4	4	3	—	1	1	2	1	—
†Halifax	3	1	—	2	4	4	—	—	20	10	—	10	4	4	—	—	4	—	—	4	1	1	—	—
Bermuda	3	2	—	1	4	3	—	1	20	19	—	1	4	4	—	—	4	3	—	1	1	1	—	—
Jamaica	3	3	—	—	2	4	2	—	10	10	—	—	2	2	—	—	2	2	—	—	1	1	—	—
†Cape of Good Hope	7	3	—	4	8	5	—	3	33	25	—	8	8	7	—	1	8	6	—	2	2	2	—	—
Trincomali	3	2	—	1	3	2	—	1	10	12	2	—	4	5	1	—	4	4	—	—	1	1	—	—
†Hong Kong	17	5	—	12	21	9	—	12	87	22	—	65	21	14	—	7	21	19	—	2	5	11	6	—
†Sydney	5	—	—	5	6	4	—	2	25	0	—	25	6	5	—	1	6	5	—	1	1	1	—	—
Esquimalt	4	3	—	1	5	11	6	—	15	27	12	—	2	2	—	—	2	3	1	—	1	2	1	—
(Dockyards, Abroad) Totals	62	33	1	30	73	60	9	22	294	185	18	127	68	57	2	13	68	59	2	11	15	22	8	1
Grand Totals and Net Shortage at Depôts	148	102	—	46	263	212	—	51	789	621	—	168	236	214	—	22	236	223	—	13	97	77	—	20
At Meteorological Office ...	45	74	29	—	120	79	—	41	250	10	—	240	80	63	—	17	80	48	—	32	50	37	—	13
Repairing	—	—	19	—	—	—	12	—	—	—	—	—	—	—	—	—	—	—	20	—	—	—	—	—
Returnable from Depôts ...	—	—	20	—	—	—	34	—	—	—	25	—	—	—	11	—	—	—	16	—	—	—	—	—
Ordered	—	—	—	—	—	—	—	—	—	—	198	—	—	—	—	—	—	—	—	—	—	—	10	—
Net Surplus or Shortage at M.O.	—	—	68	—	—	—	5	—	—	—	—	17	—	—	—	6	—	—	4	—	—	—	—	3
Proposed to be Ordered ...	—	—	—	—	—	—	(50)	—	—	—	(210)	—	—	—	(28)	—	—	—	(10)	—	—	—	(25)	—

† Supplies have been sent since 31st December, 1903. NOTE.—No change has occurred in the Stocks of Hydrometers.

1st March, 1904.

R. F. Wallace.

900. *Instruments: Mercantile Marine:—*

RETURN OF AVAILABLE INSTRUMENTS AT AGENCIES AND M.O. FOR QUARTER ENDING DECEMBER 15TH, 1903.

(*Suggested Establishments.*)

Agency.	Barometers.				Thermometers.				Hydrometers.				Screens.			
	Est.	Store.	+	—	Est.	Store.	+	—	Est.	Store.	+	—	Est.	Store.	+	—
Cardiff	6	4	—	2	36	30	—	6	24	16	—	8	6	5	—	1
Dundee	6	4	—	2	36	14	—	22	24	17	—	7	6	—	—	6
Glasgow	6	6	—	—	36	21	—	15	24	24	—	—	6	6	—	—
Hull	3	4	1	—	18	16	—	2	12	14	2	—	3	4	1	—
Liverpool	6	6	—	—	36	6	—	30	24	12	—	12	6	5	—	1
Southampton ...	6	4	—	2	36	23	—	13	24	12	—	12	6	6	—	—
Sunderland	4	1	—	3	24	18	—	6	16	12	—	4	4	3	—	1
Totals ...	37	29	1	9	222	128	—	94	148	107	2	43	37	29	1	9
Net shortages ...	—	—	—	8	—	—	—	94	—	—	—	41	—	—	—	8
Meteorological Office	20	11	—	9	120	76	—	44	80	1	—	79	20	12	—	8
Repairing ...	—	—	4	—	—	—	—	—	—	—	—	—	—	—	12	—
Returnable ...	—	—	5	—	—	—	—	—	—	—	—	—	—	—	—	—
Ordered ...	—	—	—	—	—	—	—	—	—	—	100	—	—	—	—	—
Net surplus or shortage.	—	—	—	—	—	—	—	44	—	—	21	—	—	—	4	—
Proposed to be ordered	—	—	(6)	—	—	—	(138)	—	—	—	(52)	—	—	—	(10)	—

March 1st, 1904. R. F. WALLACE.

901. *Publications: Monthly Wind Charts of the South Atlantic.*—Submitted—Notes to accompany the Charts, drawn up by the Marine Superintendent.

Referred to the Hydrographer.

902. *Forecast Districts* (832).—Submitted—A report by Mr. Gaster, giving the result of the analysis of the data for the district England, N.W., for January and July for three years, arranged according to type of weather determined by the general trend of the isobars over the district. An experimental form of diagram to show the results thus obtained is given on pp. 115–118.

903. *Logs.*—Six received, none excellent ; one abbreviated register.

904. *Storm Warnings:—*

Signals hoisted on 2 days ; total number of districts warned, 12.
In 4 districts the warnings were justified by subsequent strong winds (force 6 or 7). In 8 districts they were not required.

Gales experienced for which no warnings were issued.—None.

The following diagrams are prepared to show the differences between the temperature, winds (direction and force), amount of cloud, and rainfall (with rain days) which have prevailed during January and July, 1896–98, in District 7 (England, N.W.) generally, and those observed at each of nine stations included in the district, together with Cronkbourne, Isle of Man.

Explanation.

Each diagram is divided into six portions, numbered I. to VI. according to certain types of weather-distribution.

The types are identified by the trend of the isobars as follows :—

Type I. when the trend of the isobars was favourable for S.E. wind.
„ II. „ „ „ S.W. „
„ III. „ „ „ N.W. „
„ IV. „ „ „ N.E. „
„ V. „ „ variable cyclonic breezes.
„ VI. „ „ „ anticyclonic breezes.

(*Continued on p.* 117.)

LAND STATIONS—JANUARY.

January, 1896–98.

AYSGARTH.

III. (18 days)	N	(13 days) IV.
41 / 100	—1·7 / —3·9	—1·9 / —2·1	190 / 133
93	V. (7 days)	105
61 N.W. (12 N.E., 24 S.W.) / 2·7	77 / —3·6	83 / 95 / —3·9	64 N.E. / 1·7
W			E
2·2 / 88 S.W. (N.W.)	—1·0 / —	—0·7 / 68	1·1 / S.E. 34 (Variable.)
83	(2 days) VI.		97
92 / 88	— 1·6 / — 1·6	—2·8 / —2·4	120 / 198
II. (40 days)	S	(13 days) I.

STONYHURST.

III. (18 days)	N	(13 days) IV.
146 / 63	—1·4 / — 1·4	—1·5 / —0·4	95 / 100
97	V. (7 days)	102
61 N.W. (S.W.) / 1·8	20 / —1·6	117 / 118 / —0·5	N.E. 84 / 0·8
W			E
2·0 / 88 S.W. (N.W.)	—2·1 / 200	166 / —2·9 / 116	0·6 / 45 S.E. (62 N.E.)
119	(2 days) VI.		108
126 / 231	—0·4 / —1·5	—0·1 / —1·3	100 / 65
II. (40 days)	S	(13 days) I.

PRESTWICH.

III. (18 days)	N	(13 days) IV.
129 / 113	—0·2 / —2·2	—0·5 / —0·9	54 / 117
120	V. (7 days)	105
N.W. 45 (S.W.) / 2·2	131 / —1·1	100 / 118 / —0·9	57 N.E. (N.W.) / 1·7
W			E
2·1 / S.W. 44 (S.E.)	—2·7 / 150	—2·7 / 166 / 119	1·6 / S.E. 62 (Variable to N.E.)
117	(2 days) VI.		114
121 / 111	— 1·2 / + 0·4	— 1·3 / —1·0	80 / 73
II. (40 days)	S	(13 days) I.

CHESTER.

III. (18 days)	N	(13 days) IV.
71 / 100	+ 0·9 / — 0·8	+ 0·6 / — 0·9	71 / 83
94	V. (7 days)	103
65 N.W. (S.W.) / 1·0	111 / + 1·9	83 / 102* / + 0·1	56 N.E. (S.E.?) / 0·9
W			E
1·4 / 59 S.W. (S.E. & N.W.)	— 1·1 / 150	— 1·8 / 333 / 83	1·1 / 84 S.E. (S.W.)
91	(2 days) VI.		109
63 / 46	— 0·8 / + 1·0	— 0·4 / — 0·8	100 / 85
II. (40 days)	S	(13 days) I.

COAST STATIONS—JANUARY.

January, 1896–98.

HOLYHEAD.

III. (18 days)	N	(13 days) IV.
86 / 125	+1·5 / +4·9	+2·3 / +2·4	25 / 100
107	V. (7 days)	105
N.W. 38 (Variable.) 4·0	148 83	111	90 N.E. 2·6
W	+2·3	+2·7	E
3·8 S.W. 77 (S.E.)	+1·9 / —	+4·4 / — 92	1·4 S.E. 55 (S.W.)
113	(2 days) VI.	88
62 / 34	+2·5 / +4·0	+2·0 / +2·7	80 / 111
II. (40 days)	S	(13 days) I.

LLANDUDNO.

III. (18 days)	N	(13 days) IV.
97 / 115	+1·2 / +2·6	+1·7 / +1·5	79 / 83
59	V. (7 days)	94
N.W. 39 (Variable.) 2·0	136 83	57	54 N.E. (S.E. & N.W.) 2·2
W	+1·8	+2·1	E
1·5 S.W. 46 (N.W. 44.)	+1·9 / —	+3·4 / — 116	1·1 N.E. 44 (N.W.; very variable.)
61	(2 days) VI.	45
79 / 100	+1·8 / +2·6	+0·9 / +2·7	83 / 58
II. (40 days)	S	(13 days) I.

BIDSTON (Liverpool Observatory).

III. (18 days)	N	(13 days) IV.
90 / 125	+1·2 / 0·0	+1·7 / −1·0	84 / 83
95	V. (7 days)	100
60 N.W. (Variable.) 3·2	103 82	104	N.E. 64 (N.W.) 1·6
W	+1·8	−0·9	E
2·7 59 S.W. (Variable.)	+1·6 / 300 166	+4·9 / 111	2·3 S.E. 83 (N.W.)
94	(2 days) VI.	109
79 / 46	−1·0 / +2·6	+0·6 / +2·7	125 / 100
II. (40 days)	S	(13 days) I.

HEYSHAM.

III. (18 days)	N	(13 days) IV.
97 / 75	−1·0 / −1·2	−1·0 / +0·6	142 / 50
109	V. (7 days)	94
N.W. 53 (Variable.) 2·5	78 117	107	N.E. 68 (Many calms.) 1·4
W	−2·1	0·0	E
3·9 S.W. 47 (S.E. to N.W.)	+1·0 / —	−3·7 / — 63	1·3 S.E. 92 (Many calms.)
103	(2 days) VI.	102
121 / 140	−1·9 / −1·6	+0·1 / 0·0	100 / 144
II. (40 days)	S	(13 days) I.

SOUTHPORT.

III. (18 days)	N	(13 days) IV.
62 / 100	−0·7 / −0·3	−0·5 / −0·7	70 / 67
116	V. (7 days)	98
57 N.W. (Variable.) 1·6	78 83	100	N.E. 50 (N.W. & N.E.) 0·6
W	+0·4	+0·1	E
0·9 51 S.W. (Variable.)	−1·4 / 300 166	−0·4 / 127	0·5 S.E. 90 (Many calms.)
107	(2 days) VI.	109
105 / 85	−0·1 / −0·9	−0·3 / −0·8	80 / 50
II. (40 days)	S	(13 days) I.

CRONKBOURNE (Isle of Man).

III. (18 days)	N	(13 days) IV
153 / 113	+1·4 / +2·1	+1·5 / +1·3	179 / 100
101	V. (7 days)	94
77 N.W. 3·3	120 100	89	N.E. 51 2·7
W	+1·7	+0·8	E
3·0 75 S.W.	+4·0 / —	−0·7 / — 92	2·8 S.E. 54 (Variable.)
104	(2 days) VI.	111
142 / 118	+2·4 / +1·6	+2·3 / +2·5	140 / 119
II. (40 days)	S	(13 days) I.

The figures in the several compartments indicate, according to the fount in which they are printed, the elements to which they refer; thus:—

(*See January diagram for Aysgarth.*)

41 (in the corner of the square) indicates the rainfall recorded on the days classed under Type III. and estimated as percentage of the mean fall for the district during those days,
100 the rain days estimated as percentage of the mean number for the district.

93 indicates the local cloudiness at the hours of observation as percentage of the mean cloudiness for the district.

61 N.W. the percentage of N.W. wind observations. Observations of calms are omitted in computing the percentage.

(12 N.E., 24 S.W.) the percentage of observations in which the wind varied from the general direction indicated by the isobaric distribution and was recorded locally under the directions N.E. and S.W. respectively.

1·1 the mean force (Beaufort Scale) recorded.

The other figures mean—

—1·7 the difference between the mean maximum for the station and the corresponding value for the district. It is marked with a — sign to show that the value for the station is below the mean for the district.

—3·9 the difference between the mean minimum for the station and the corresponding value for the district.

LAND STATIONS—JULY.

July, 1896–98.

AYSGARTH.

III. (28 days)	N		(6 days) IV.
187 86	*0·0* −3·1	*−3·4* −3·8	36 340
95	V. (8 days)		114
N.W. 36 (S.W. 38.) 2·8	275 90	99	N.E. 50 (Many calms.) 1·5
W	*−3·1*	−4·6	E
2·3 67 S.W. (Variable.)	*+0·5* —	−3·0 82	0·8 S.E. — (N.E. 75.)
86	(14 days) VI.		71
75 59	−3·3 *−1·2*	−4·7 *−0·6*	100 117
II. (35 days)	S		(2 days) I.

STONYHURST.

III. (28 days)	N		(6 days) IV.
250 144	*−1·5* −0·7	*+0·1* −1·0	— —
113	V. (8 days)		109
30 N.W. (53 S.W.) 1·7	75 125	104	N.E. 75 1·1
W	*−1·5*	−0·8	E
1·6 56 S.W. (N.W.)	*−0·3* 6 110	−1·8 118	1·3 S.E. 50 (N.W. 50.)
111	(14 days) VI.		108
110 125	−1·0 *−1·5*	0·0 *−0·7*	100 33
II. (35 days)	S		(2 days) I.

PRESTWICH.

III. (28 days)	N		(6 days) IV.
53 100	*+0·7* −0·9	*+1·0* −0·4	— —
110	V. (8 days)		143
N.W. 50 (Variable.) 2·3	95 125	107	46 N.E. (S.E.) 2·3
W	*+0·2*	−0·1	E
2·2 S.W. 26 (N.W. 34.)	*+1·8* —	−2·2 135	3·3 S.E. 63
105	(14 days) VI.		122
110 83	−1·4 *−0·2*	*−5·5* *+2·4*	100 158
II. (35 days)	S		(2 days) I.

CHESTER.

III. (28 days)	N		(6 days) IV.
61 129	*+2·8* −0·7	*+4·3* −0·4	704 340
94	V. (8 days)		106
N.W. 67 (N.E. & S.W.) 2·1	53 90	98	25 N.E. (S.E. 29.) 0·9
W	*+5·2*	+1·2	E
1·8 S.W. 21 (N.W. 42.)	*+3·8* 44 110	−0·2 112	2·8 63 S.E. (S.W. 37.)
93	(14 days) VI.		82
95 59	+0·6 *+4·5*	+0·6 *+2·8*	100 42
II. (35 days)	S		(2 days) I.

COAST STATIONS—JULY.

July, 1896-98.

HOLYHEAD.

III. (28 days)	N	(6 days) IV.
121 / 100	−1·5 / +0·7	−2·8 / +2·7	— / –
98	V. (8 days)	83
51 N.W. (S.W. 34.) 3·2	103 125 101	N.E. 79 (N.W. 13.) 2·2
W	−3·9	+1·2	E
3·0 87 S.W. (Variable.)	−3·5	+1·7	3·5 S.E. 50 (N.E. & S.W.)
103	222 220 88 (14 days) VI.	98
100 / 142	+0·9 / −1·9	+4·1 / −1·6	100 / 109
II. (35 days)	S	(2 days) I.

LLANDUDNO.

III. (28 days)	N	(6 days) IV.
47 / 71	+0·1 / +2·0	−1·8 / +2·6	— / –
79	V. (8 days)	43
61 N.W. (S.W.) 1·9	79 90 96	N.E. 46 (N.W. & S.E.) 1·6
W	+1·3	+3·2	E
2·4 49 S.W. (38 N.W.)	−1·0	+2·1	1·7 S.E. 25 (S.W. 50.)
82	178 110 86 (14 days) VI.	92
95 / 87	+2·8 / +0·8	+1·3 / +2·1	100 / 25
II. (35 days)	S	(2 days) I.

BIDSTON (Liverpool Observatory).

III. (28 days)	N	(6 days) IV.
95 / 29	−1·4 / +0·9	−0·9 / +1·2	— / –
105	V. (8 days)	94
69 N.W. (S.W.) 2·9	44 90 96	N.E. 50 (N.W. & S.E.) 1·8
W	+1·3	+0·7	E
2·6 45 S.W. (N.W. 31.)	−0·9	+2·3	2·5 S.E. 100
97	22 110 100 (14 days) VI.	112
100 / 74	+0·4 / +1·1	+1·4 / −0·7	100 / 50
II. (35 days)	S	(2 days) I.

HEYSHAM.

III. (28 days)	N	(6 days) IV.
53 / 71	+2·2 / +0·5	+3·3 / −0·1	— / –
108	V. (8 days)	120
68 N.W. (N.E.) 3·4	81 90 96	N.E. 12 (S.E. 38.) 1·4
W	+1·6	−0·4	E
2·8 S.W. 39 (N.W. 40; variable.)	+2·6	+0·3	3·0 S.E. 75
115	— – 96 (14 days) VI.	102
90 / 119	+0·8 / +0·8	+2·1 / 0·0	100 / 117
II. (35 days)	S	(2 days) I.

SOUTHPORT.

III. (28 days)	N	(6 days) IV.
47 / 71	−1·6 / +1·9	+0·3 / −2·3	— / –
106	V. (8 days)	94
63 N.W. (Variable S.W. & N.E.) ?1·6	134 68 105	N.E. 12 (S.E. 29 & 50 calms.) ?0·3
W	+1·1	−0·3	E
?1·2 S.W. 41 (N.W. 26; many calms.)	−1·2	+2·7	?1·0 S.E. 50
103	22 110 102 (14 days) VI.	92
85 / 93	+1·4 / −0·6	−1·2 / +0·4	100 / 108
II. (35 days)	S	(2 days) I.

CRONKBOURNE (Isle of Man).

III. (28 days)	N	(6 days) IV.
89 / 129	0·0 / −1·1	−0·2 / +1·3	222 / 340
86	V. (8 days)	80
83 N.W. 3·2	63 125 88	N.E. 58 (N.W.) 2·3
W	−2·2	−0·2	E
2·6 46 S.W. (N.W. & S.E.)	−1·5	−2·0	2·9 S.E. 75
103	500 222 74 (14 days) VI.	118
115 / 157	−1·7 / −2·3	+0·5 / −3·8	100 / 225
II. (35 days)	S	(2 days) I.

905. *Accounts* (1)—*Audit.*—Reported—That the cash accounts for the quarter ended the 31st December last had been this day examined by Prof. Darwin and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st October last, when there was a balance of £1,960 12*s.* 9*d.*, were £3,909 10*s.* 11*d.* against £3,924 17*s.* 8*d.* in the corresponding period of the preceding financial year. The payments were £4,440 14*s.* 8*d.* against £3,982 17*s.* 7*d.* during the same period in the previous year. The balance in hand and at the bank on the 31st December, amounted to £1,429 9*s.* 0*d.*, and at the same date in 1902 to £1,610 14*s.* 1*d.*

——(2)—Submitted—The following statement:—

	£	*s.*	*d.*
Cash balance on 23rd February, 1904	4,864	4	3
Receipts from 24th February to 8th March, 1904 ...	60	10	9
	4,924	15	0
Cheques drawn from 24th February to 8th March, 1904	838	1	8
Cash balance on 8th March	£4,086	13	4

906. *Reports of Work* for the month of February were submitted and approved.

907. *Library.*—A list of publications received since the last meeting of the Council was laid on the table.

63, *Victoria Street, S.W., 23rd March*, 1904.

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.

PROFESSOR DARWIN. | THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

908. The Minutes (888–907) of the last meeting, 9th March, were read and confirmed.

909. *International Telegraphic Service* (889).—The Secretary reported that the arrangements for telegrams to the Seewarte had been brought into operation in accordance with Minutes 857, 889, from 1st March.

He reported also the receipt of a letter, M.O. 688, from the Post Office, enclosing a letter from the Reichs-Postamt, with request for observations thereupon, and his reply thereto, P.C. 937; also a further letter from the Seewarte, M.O. 703, asking for some incidental alterations in the details of the arrangements for which instructions had been already given.

Approved.

910. *Publications: Rainfall Tables* (844, 859, 910).—Read—The following letter:—

M.O. 647.

62, Camden Square,
London, N.W.,
12th March, 1904.

DEAR DR. SHAW,

I AM in receipt of your letter of the 7th requesting me to give an estimate for providing data and editing a continuation of the Meteorological Council's "Rainfall Tables" for 1866–90.

As I understand it, the work would consist of 500 tables, each containing the monthly rainfall at one station, set out for each year with the mean value for each lustrum, either for the two lustra comprised in the period 1891–1900, or for the three lustra comprised in the period 1891–1905 as may be required. Where earlier records of any station have appeared in the existing "Rainfall Tables," the mean monthly falls of the earlier lustra would be added to the table, together with the mean for the whole period and the maximum and the minimum rainfall of each month with the year in which it occurred, and finally, the mean for 40 years.

I would suggest that in the case of stations which did not appear or were incomplete in the earlier "Rainfall Tables," it might be possible for me to supply mean values for part at least of the earlier lustra, and in any case a mean might be computed for the 40 years, thus greatly enhancing the value of the work.

In the estimate of cost, which follows, this item is distinguished from the rest.

Maps would be prepared showing the mean annual isohyetals of the British Isles, together with the means of the stations published in the Table. I would also suggest that a set of monthly rainfall maps on a smaller scale might be prepared, and a separate item for this is added to the estimate of the cost.

An introduction explaining the principle on which the stations had been selected would be prepared, and reference might be made in it to the general facts of distribution as brought out by the maps.

I should be glad to undertake the work of editing the Tables, as explained in your letter, on the terms stated below.

It would probably be found possible to complete the copy and maps ready for the printer in about 10 months from commencing work if the new matter is to refer only to the 10 years ending 1900, or by the month of October, 1906, if the data are to include the five years ending with 1905.

For editing the work, including the selection of stations, working mean values for the lustra, preparing maps, and writing an introduction, I would suggest an honorarium of £125 if the new material includes two lustra, or £150 if it includes three lustra.

I am prepared to supply the rainfall data for all stations necessary to supplement those furnished by the Meteorological Council at the rate of 7*s.* 6*d.* per lustrum per station for the first 400, at the rate of 6*s.* 3*d.* per lustrum per station for the next 200, and at the rate of 5*s.* per lustrum per station for any additional number.

Mean values of the lustra before 1890 in the case of stations not given in the previous volumes could be supplied at the rate of 2*s.* per lustrum per station.

In order to make this estimate quite clear, the total amounts in the two alternative cases are set out below on the assumption that the number of stations for which I should supply data is 350, and that 100 stations would require the mean values of the five lustra prior to 1890.

These figures are, of course, merely given for the purpose of illustration, and are not an estimate of the probable number required.

	For 10 years.	For 15 years.
	£ *s.* *d.*	£ *s.* *d.*
Supplying 400 lustra at 7*s.* 6*d.*	150 0 0	150 0 0
„ 200 „ 6*s.* 3*d.*	62 10 0	62 10 0
„ 100 „ 5*s.*	25 0 0	25 0 0
„ 350 „	—	87 5 0
„ 100 mean values for 5 lustra at 2*s.*	50 0 0	50 0 0
Editing	125 0 0	150 0 0
Totals	£412 10 0	£524 15 0

£10 10*s.* should be added if monthly rainfall maps are required. I shall be happy to give any further explanation if necessary.

In the event of these terms being accepted, it would be convenient if an arrangement were made for occasional payments on account after the work has been commenced.

Yours sincerely,

HUGH ROBERT MILL.

Reported—That 55 copies of the 1897 volume were reported as sold by the Stationery Office.

A general approval was given to the proposal to proceed with the preparation of the volume on the terms of Dr. Mill's letter with the understanding that it was desirable to extend the tables to include 1905, but that the work for the 10 years to 1900 should be taken in hand first and that for the last five years should be left for subsequent final decision.

The Secretary was directed to report further upon the expense of the publication and the funds available to meet it.

911. *Publications: Official Copies of No.* 71 (872).—It was resolved to apply to the Stationery Office for a further supply of 40 official copies of No. 71, and it was also resolved that proposals for the presentation of copies of the publication be specially reported to the Council for approval.

912. *Stations:* (i.) *London.*—The Secretary reported an interview with Major Hussey, R.E., of the Office of Works, from which he understood that the Board were disposed to meet the wishes of the Council in the matter, and he was directed to proceed with the arrangement of details.

912. *Stations:* (ii.) *Elan Valley, Rhayader, Mid-Wales.*—Submitted—The following report :—

ELAN VALLEY, RHAYADER, MID-WALES.

I met Mr. Lees, as arranged, on 11th March. He was most desirous of helping in meteorological work, but it was not practicable to establish a station immediately. The engineering work is at present far from completed, so that the permanent resident officer, who would eventually be the observer, has not yet been appointed and the site on which his house is to be built has not yet been decided on. A site for a permanent station could consequently not be selected.

We discussed the possibility of establishing a temporary station under the control of a member of the present staff (medical or engineering), but no satisfactory arrangement could be arrived at.

Three positions were suggested and inspected—

1. Near the hospital for infectious diseases, in charge of one of the resident doctors. The exposure was on a rather steep hillside. It was rejected, as there is some probability of the observer changing his quarters within the next few months.

2. Near the general hospital. Rejected as being too freely exposed to attack by navvies from the neighbouring village.

3. Near the temporary offices. The exposure would have been good meteorologically, but the site will shortly be submerged.

The residence of the permanent officer will not improbably be near the lowest dam, where the navvies' village is at present situated.

The valley here becomes very narrow, and the meteorological conditions which obtain there would be those of a deep and narrow valley at an altitude of about 800 ft., the surrounding heights being little short of 2,000 ft.

I noted a piece of ground which will give a suitable exposure for the instruments (except the sunshine recorder, for which it will not be possible to obtain a site freely exposed at all hours of the day) after the departure of the navvies.

Under the circumstances, I suggested to Mr. Lees that we should leave the matter in abeyance until the engineering works are completed and permanent arrangements have been made. This will probably require from one to two years.

R. G. K. LEMPFERT.

——. (iii.) *Armagh.*—It was agreed to supply 1-ft. and 4-ft. earth thermometers to Armagh Observatory, Dr. Dreyer having expressed his willingness to read the instruments and report the observations to the Office.

——. (iv.) *Brompton Barracks, Chatham.*—Read—The following letter :—

"M.O. 666.

Brompton Barracks,
Chatham,
15th March, 1904.

DEAR SIR.

WITH reference to M.O. 288, of 3rd February, 1904, I am authorised by the Assistant Commandant to inform you that it has been decided to discontinue taking meteorological observations at the School of Military Engineering—at any rate for the present—as some of the instruments will probably be moved in connection with the building of a new observatory.

I am, &c.,
C. RUSSELL-BROWN,
Captain, R.E.

The Secretary,
Meteorological Office.

913. *Telegraphic Reporting Stations: Stornoway.* — Reported — Correspondence (M.O. 634) respecting the time of observations in the afternoon at Stornoway on account of the pressure of business in the telegraph office about 2 p.m. in connexion with the fisheries.

It was resolved that the observations be made punctually at 2 p.m. and the telegrams handed in at a fixed time, and that inquiry be made of the Post Office in case the telegrams were not received in proper time in London.

914. *Harvest Forecasts.*—A proof of the circular for 1904 on the same lines as that of last year was submitted and approved.

915. *Forecasts: Distribution of Evening Reports.*—The Secretary was authorised to report upon the organisation of a system of distribution of evening reports by telephone or by hand to newspapers, clubs, &c., provided that the necessary charges could be met by subscriptions from the recipients.

916. *Forecasts.*—Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of February, 1904 :—

The letters used have the following signification :—

a = complete success.
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	48	66	57	
"	b	38	31	35	92
"	c	11	3	7	
"	d	3	0	1	
Scotland, E.	a	38	79	59	
"	b	21	17	19	78
"	c	31	4	17	
"	d	10	0	5	
England, N.E.	a	41	76	59	
"	b	28	21	24	83
"	c	28	0	14	
"	d	3	3	3	
England, E.	a	52	62	57	
"	b	35	35	35	92
"	c	10	3	7	
"	d	3	0	1	
Midland Counties	a	38	59	49	
"	b	38	34	36	85
"	c	24	7	15	
"	d	0	0	0	
England, S.	a	45	62	54	
"	b	41	35	38	92
"	c	14	3	8	
"	d	0	0	0	
Scotland, W.	a	42	69	56	
"	b	34	24	29	85
"	c	17	4	10	
"	d	7	3	5	
England, N.W.	a	35	72	54	
"	b	52	14	33	87
"	c	10	7	8	
"	d	3	7	5	
England, S.W.	a	38	76	57	
"	b	38	17	28	85
"	c	10	4	7	
"	d	14	3	8	
Ireland, N.	a	38	73	56	
"	b	31	24	27	83
"	c	21	3	12	
"	d	10	0	5	
Ireland, S.	a	31	73	52	
"	b	28	24	26	
"	c	34	0	17	78
"	d	7	3	5	
Summary.					
British Islands	a	41	70	56	
"	b	35	25	30	86
"	c	19	3	11	
"	d	5	2	3	

917. *Instruments, Marine.*—Authority was given for the order of instruments as proposed in Minutes 899, 900.

918. *Burroughs Registering and Adding Machine.*—The Secretary reported that, at the suggestion of the Chairman, a specimen of the Burroughs Registering and Adding Machine had been on trial in the Observatory Branch since 16th March, and had been found to work satisfactorily in the preparation of tables of pressure, temperatures, and wind values from the tabulation sheets.

It was resolved to retain the instrument in the Office, and authority was given to pay the cost, £85.

919. *Logs.*—Nine received, one excellent—Captain F. Blight; also one abbreviated log.

920. *Storm Warnings:*—

Signals hoisted on 3 days; total number of districts warned, 10.
In 2 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 5 districts by subsequent strong winds (force 6 or 7). In 3 districts they were not required.

Gales experienced without warnings.—A slight gale from W. or N.W. occurred on 22nd March on a few exposed parts of our northern coasts. This was caused by a small secondary depression which lay at 8 a.m. off the north of Scotland, and was expected to move away to the Eastward. The disturbance pursued a more southerly course, the barometer rose rapidly in its rear, and a steep gradient was formed, quite temporarily, over our northern districts.

921. *Accounts.*—Submitted—The following statement:—

	£	s.	d.
Cash balance on 8th March	4,086	13	4
Receipts from 9th to 22nd March	86	19	2
	4,173	12	6
Cheques drawn from 9th to 22nd March	178	11	0
Cash balance on 22nd March	£3,995	1	6

922. *Library.*—A list of publications received since the last meeting was laid on the table.